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Systems Cost/Performance Analysis (Study 2.3) Final Report

Volume II, Appendix A: Data Base

Prepared by

ADVANCED MISSION ANALYSIS DIRECTORATE
Advanced Orbital Systems Division

31 March 1975

Prepared for

OFFICE OF MANNED SPACE FLIGHT
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Washington, D.C. 20546

Contract No. NASW-2727

Systems Engineering Operations

THE AEROSPACE CORPORATION

Aerospace Report No.
ATR-75(7363)-3, Vol. II, App. A

SYSTEMS COST/PERFORMANCE ANALYSIS (STUDY 2.3)
FINAL REPORT

Volume II, Appendix A: Data Base

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Advanced Mission Analysis Directorate
Advanced Orbital Systems Division

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SYSTEMS COST/PERFORMANCE ANALYSIS
(STUDY 2.3) FINAL REPORT

Volume II, Appendix A: Data Base

Prepared

B. H. Campbell
NASA Study 2.3 Manager
Advanced Mission Analysis
Directorate

Approved

R. H. Herndon, Group Director
Advanced Mission Analysis
Directorate
Advanced Orbital Systems Division

FOREWORD

This report documents The Aerospace Corporation effort on Study 2.3, Systems Cost/Performance Analysis, performed under NASA Contracts NASW-2575 and NASW-2727 during Fiscal Years 1974 and 1975. The effort was directed by Mr. B. H. Campbell. Mr. R. D. Kramer, Marshall Space Flight Center and Mr. R. R. Carley, NASA Headquarters were the NASA Study Directors for this study. Their efforts in providing technical direction throughout the duration of the study are greatly appreciated.

This volume is one of three volumes of the final report for Study 2.3. The three volumes are:

Volume I	Executive Summary
Volume II	Systems Cost/Performance Model
Appendix	Data Base
Volume III	Programmer's Manual and User's Guide

Volume I summarizes the overall report. It includes the relationship of this study to other NASA efforts, significant results, study limitations, and suggested additional effort.

Volume II provides a detailed description of the Systems Cost/Performance Model. It also includes the model checkout and the results for three payload test cases. The Data Base is provided in the Appendix to Volume II.

Volume III provides a detailed description of how the Systems Cost/Performance Computer Program is organized and operates. The program listing, detailed flow charts and user restrictions are included.

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R. M. Allman
B. E. Ayotte

Structure
E. R. Johnson

Thermal Control
H. H. Yoshikawa

Vehicle Sizing
R. T. Blake

CONTENTS

TABLES

1. INTRODUCTION

1. INTRODUCTION

This appendix contains data on selected payload equipments (components) which have been collected for the purpose of exercising the Systems Cost/Performance Model. The reader should be aware that, although most of the data is accurate, approximations based on engineering judgment and experience are used wherever actual data was unavailable. The approximations are justified by the objective of the study which was to develop a cost/performance model. Assuming that the model is successfully developed and is accepted for use by a body of users, the data base should be expanded and the approximations replaced by actual data. The following paragraphs are devoted to an explanation of how the data are organized and how to interpret the information contained on the data pages.

The equipments are organized according to the following subsystems which use the specific components:

a. Stabilization and Control
b. Auxiliary Propulsion
c. Data Processing
d. Communication
e. Electrical Power

The data sheet for each component states which subsystem utilizes the component, which configurations require the component, which equipment type the component is categorized as, and the data base identifier or code number assigned to the component.

The data describing the component consist of the following four types:

a. Performance
b. Safety
c. Cost
d. Schedule

1.1 PERFORMANCE DATA

The performance data are separated into eight categories:

a. Technical Characteristics
b. Power
c. Weight
d. Volume
e. Vibration
f. Temperature
g. Pressure
h. CDPI

The technical characteristics are peculiar to each equipment type. Generally speaking, the technical characteristics provide the data required to select or differentiate among the components and additional data for the component which, if selected, provides information for design of the remainder of the subsystem.*

The power data includes three basic descriptions: the power requirements, the voltage requirements, and the conversion requirements. The average power is the average power required by the component during its active state. The maximum power is the power required either during load conditions or during any high power transient periods. The minimum voltage requirement exists during quiescent periods, powered down periods, or the turned-off condition, if allowable.

The voltage requirements are the specifications for which the equipment is rated, i.e., the nominal voltage, and the maximum and minimum voltages for which the component will continue to perform within specifications.

If the specific component is selected, the converter/inverter requirement flag identifies any need for special power conversion equipment. Since the requirement is identified as a flag, the number used should correspond to the identifier for the actual converter or inverter required.

*NA is used in the data base to signify that the data is not applicable.

The component weight includes all weight which is essential to performing the functions associated with the component. Examples of additional functional weight include:

a. Telemetry instrumentation
b. Failure sensing and switching
c. Interface equipment which is not ordinarily a separate component as selected by the Systems Cost/Performance Model.

Weight which comes under different functional descriptions is not included. Examples are:

a. Wiring harness
b. Structural mountings

Volume is the direct counterpart of weight and is determined according to the same rules.

The vibration specification includes both random and nonrandom categories. Although vibration is not used in the current model, the intent is to use the specification in future models.

The maximum and minimum temperature information are the temperature specifications for which the equipment is qualified.

The pressure information is the ambient pressure for which the component is qualified.

The CDPI information for each component is used for the express purpose of designing the Data Processing and Communication Subsystems. Command requirements are divided into three categories: power, time tagged, and other. The telemetry requirements are separated into two categories, i.e., low rate and high rate telemetry requirements. The telemetry information includes:

a. Number of analog telemetry points
b. Number of digital telemetry points
c. Sample rate.
d. Word length

1.2 SAFETY DATA

The intent in supplying the safety information is to indicate the failure mode, the numerics describing the failure mode, the redundancy type, and the maximum amount of redundancy. To this end, the failure model as stated in the data base indicates both the failure mode and the redundancy type. If the failure mode is modeled by an exponential, then the failure rate must be provided. Both the mean and standard deviation are supplied in the event of a normal (gaussian) failure mode. The dormancy factor must be provided for either failure mode. Because the Systems Cost/Performance Model can add an undesirable (from an engineering point of view) amount of redundancy, the total allowable number of redundant elements is specified. This redundancy number includes both the original number of components as well as the components added for the purpose of increasing system reliability.

1.3 COST DATA

Component cost information must be supplied for each of the following three categories:

a. Design engineering
b. Test and evaluation
c. Unit production

An additional piece of information which must be provided is the reference quantity required to meet the performance requirements. Redundancy is not included in the reference quantity. A nondimensional factor has been provided for use in future models where the effect of standardization or use of off-the-shelf hardware is to be incorporated.

1.4 SCHEDULE DATA

Component schedule data includes both the development lead time and the qualification lead time. Each lead time is separated into a constant and a variable. Normally, the constant lead times will be exactly the same

for all components of the same type. In addition, a state-of-art factor is provided based on the component being in a state of development somewhere between off-the-shelf and a new concept requiring an advance in technology.

1.5 ARTIFICIAL COMPONENTS

The focus of the current study has been on the development of a working model in deference to a complete user oriented operational program with an expanded data base. Only after the model was successfully developed and proven as a useful tool could data collection be justified at such a detailed level. Hence, certain artificial equipment descriptions were developed and placed in the data base for the express purpose of exercising and checking out the Cost/Performance Computer Program. The components having a 9 (e.g., S&C 1399) as the third digit in the equipment identifier were used to check out the macro search mode of the computer program. These components are summarized in Table 1-1. Components in the data base having a 5 (e.g., S&C 0151) as the third digit in the equipment identifier were used to check out the micro search mode. Table 1-2 lists these components.

Table 1-1. Artificial Components for Macro-Search

Component Identifier		Equipment Type	Artificial Characteristics	Original Component
S&C	1399	Reaction Wheel Assy.	Nominal monentum: 691 m-kg-sec (5000 ft-lb-sec)	1301
APS	0399	Filter	Flow resistance: 3.33×10^6 N/(kg-m)^2 (100 psi sec^2/lb^2)	0301
APS	0499	Pressure Regulator	Flow area: 6.5 cm^2 (1.0 in.^{2}) Minimum set point: 6.9×10^4 N/m^2 (10 psia) Maximum set point: 6.2×10^6 N/m^2 (900 psia)	0403
APS	0599	Tank	Volume: 4.0×10^8 cm^3 (100,000 in.^{3})	0508
APS	0999	Isolation Valve	Flow area: 6.4 cm^2 (1.0 in.^{2})	0902
APS	1699	Tank	Volume: 4.9×10^6 cm^3 (300,000 in.^{3}) Maximum pressure: 2.07×10^7 N/m^2 (3000 psia)	1604
COMM	0199	Baseband Assy. Unit	First data rate: 256 kbps First subcarrier: 1.7 MHz	0101
COMM	0397	Transmitter	First subcarrier: 1.7 MHz	0301
COMM	0398	Transmitter	Power output: 50 watts	0302
COMM	0399	Transmitter	Power output: 5 watts	0302

Table 1-1. Artificial Components for Macro-Search (Continued)

Component Identifier		Equipment Type	Artificial Characteristics	Original Component
EP	0198	Shunt Regulator	Power capacity: 130 watts	0102
EP	0199	Shunt Regulator	Power capacity: 260 watts	0102
EP	0399	Battery Charger	Current rating: 30 amps	0301
EP	0499	Discharge Regulator	Power capability: 300 watts	0401
EP	0598	Shunt Regulator	Power capacity: 130 watts	0501
EP	0599	Shunt Regulator	Power capacity: 260 watts	0501
EP	0699	Battery Charger	Current rating: 30 amps	0601

Table 1-2. Artificial Components for Micro-Search

Component Identifier		Equipment Type	Original Component
S&C	0151	Despin Assembly	0101
S&C	0252	Valve Driver	0202
S&C	0352	Sun Sensor	0302
S&C	0451	Nutation Damper	0401
S&C	0551	Gimbal Electronics	0501
S&C	0651	Control Timing Assembly	0601
S&C	0751	Biaxial Drive	0701
S&C	0851	Earth Sensor	0801
S&C	0951	Sun Sensor	0302
S&C	1051	Control Electronics	1001
S&C	1151	Rate Gyros	1101
S&C	1251	Horizon Sensor	1201
S&C	1359	Reaction Wheel	1399
S&C	1451	Power Converter	1401
S&C	1551	Attitude Reference Electronics	1501
S&C	1651	Valve Driver	1601
S&C	1752	Rate Integrating Gyros	1702
S&C	1851	Horizon Sensor	1801
S&C	1951	Electronics Processing	1901
S&C	2051	Control Moment Gyro	2001
S&C	2151	Star Sensor	2101
S&C	2152	Star Sensor	2102
S&C	2153	Star Sensor	2103
S&C	2251	Electronic Error Processor	2201
APS	0254	Isolation Valve	0204
APS	0359	Filter	0399
APS	0459	Pressure Regulator	0499
APS	0559	Pneumatic Tank	0599

Table 1-2. Artificial Components for Micro-Search (Continued)

Component Identifier	Equipment Type	Original Component
APS 0651	Fill and Vent Valve	0601
APS 0751	Relief Valve	0701
APS 0959	Isolation Valve	0999
APS 1052	Filter	1002
COMM 0151	Baseband Assembly Unit	0101
COMM 0251	Antenna	0201
COMM 0252	Antenna	0202
COMM 0253	Antenna	0203
COMM 0254	Antenna	0204
COMM 0255	Antenna	0205
COMM 0256	Antenna	0206
COMM 0351	Transmitter	0301
COMM 0352	Transmitter	0302
COMM 0355	Transmitter	0305
COMM 0358	Transmitter	0398
COMM 0359	Transmitter	0399
COMM 0451	Receiver	0401
COMM 0552	Signal Conditioner	0502
COMM 0751	Power Converter	0701
COMM 0752	Power Converter	0702
EP 0359	Battery Charger	0399
EP 0459	Discharge Regulator	0499
EP 0559	Shunt Regulator	0599
EP 0751	Central Control Unit	0701
EP 0851	Series Load Regulator	0801
EP 0951	Battery Charger	0901
EP 1051	Solar Power Distributor	1001
EP 1151	Power Distributor	1101
EP 1251	Power Control Unit	1201

2. EQUIPMENT DATA

2. EQUIPMENT DATA

Subsystem: S&C (0101)

Configurations: Dual Spin

Equipment Type: Despin Mechanical Assembly

Performance

Technical Characteristics

(1) Bearing and motor friction (3σ):	1.1 mrad	(0.064 deg)
(2) Bearing runout (3σ):	0.21 mrad	(0.012 deg)
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	2.0
Maximum Power (watts):	88.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 9.87 (21.75 lb)

Volume (cc): 1.78×10^4 (0.627 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	322 (120^o F)
Minimum (^oK):	266 (20^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI	
Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	1
High Rate Telemetry	
Analog Points (No.):	4
Digital Points (No.):	1
Sample Rate (sec^{-1}):	1
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	12
Digital Points (No.):	1
Sample Rate (sec^{-1}):	0.0075
Word Length (bits):	8
Safety	
Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	400
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	1
Cost	
Design Engineering ($1000):	1000.0
Test and Evaluation ($1000):	300.0
Unit Production ($1000):	70.0
Reference Quantity (No.):	1
Factor (N.D.):	1
Schedule	
Development Lead Time Constant (months):	6.6
Development Lead Time Variable (months):	2.8
Qualification Lead Time Constant (months):	0.9
Qualification Lead Time Variable (months):	0.1
State-of-Art Factor (N.D.):	1.0

Subsystem: S&C (Included in 0101)

Configurations: Dual Spin

Equipment Type: Despin Electronics Assembly

Performance

Technical Characteristics

(1)

(2)

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts):	6.24
Maximum Power (watts):	9.5
Minimum Power (watts):	3.0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 3.9 (8.5 lb)

Volume (cc): 8.5×10^3 ($0.30\ ft^3$)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100^o F)
Minimum (^oK):	275 (35^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	2
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	3
Sample Rate (sec^{-1}):	1
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	1
Digital Points (No.):	1
Sample Rate (sec^{-1}):	0.0075
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean (x $10^{\pm 9}$ hr):	13,700
Standard Deviation (x 10^{+9} hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	3

Cost

Design Engineering ($1000):	320.0
Test and Evaluation ($1000):	206.0
Unit Production ($1000):	92.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	7.3
Development Lead Time Variable (months):	3.1
Qualification Lead Time Constant (months):	1.1
Qualification Lead Time Variable (months):	0.1
State-of-Art Factor (N.D.):	1.0

Subsystem: S&C (0201)

Configurations: All

Equipment Type: Valve Driver Assembly

Performance

Technical Characteristics

(1) Number of valves: 12

(2)

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts): 1.0

Maximum Power (watts): 36.0

Minimum Power (watts): 0

Nominal Voltage (volts): 28.0

Maximum Voltage (volts): 32.0

Minimum Voltage (volts): 22.0

Converter/Inverter Requirement (flag): C 01 (1401)

Weight (kg): 0.73 (1.6 lb)

Volume (cc): 1.4×10^3 ($0.05\ ft^3$)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK): 322 (120^o F)

Minimum (^oK): 266 (20^o F)

Pressure (kg/m^2):

Performance (continued)

- CDPI
  - Power Switching Commands (No.): 2
  - Time Tagged Commands (No.):
  - Other Commands (No.): 8
  - High Rate Telemetry
    - Analog Points (No.): 13
    - Digital Points (No.):
    - Sample Rate (sec^{-1}): 125
    - Word Length (bits): 8
  - Low Rate Telemetry
    - Analog Points (No.): 4
    - Digital Points (No.):
    - Sample Rate (sec^{-1}): 1
    - Word Length (bits): 8

Safety

- Failure Model (flag): 1
- Failure Parameters
  - Failure Rate or Mean ($\times 10^{\pm 9}$ hr): 1910
  - Standard Deviation ($\times 10^{+9}$ hr):
  - Dormancy Factor (N.D.): 0.5
- Total Redundant Elements (No.): 4

Cost

- Design Engineering ($1000): 39.0
- Test and Evaluation ($1000): 28.0
- Unit Production ($1000): 10.0
- Reference Quantity (No.): 2
- Factor (N.D.): 1

Schedule

- Development Lead Time Constant (months): 2.6
- Development Lead Time Variable (months): 0.2
- Qualification Lead Time Constant (months): 3.0
- Qualification Lead Time Variable (months): 0.1
- State-of-Art Factor (N.D.): 1.0

Subsystem: S&C (0202)

Configurations: All

Equipment Type: Valve Driver Assembly
(3 assemblies for 6 valves)

Performance

Technical Characteristics

(1) Number of valves: 6

(2)

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts): 0.12

Maximum Power (watts): 27.0

Minimum Power (watts): 0

Nominal Voltage (volts): 28.0

Maximum Voltage (volts): 32.0

Minimum Voltage (volts): 24.0

Converter/Inverter Requirement (flag):

Weight (kg): 1.9 (4.2 lb)

Volume (cc): 1.2×10^4 (0.42 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK): 322 (120^o F)

Minimum (^oK): 266 (20^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	3
Sample Rate (sec^{-1}):	1
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	966
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	164.0
Test and Evaluation ($1000):	15.0
Unit Production ($1000):	21.0
Reference Quantity (No.):	1
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	2.6
Development Lead Time Variable (months):	2.0
Qualification Lead Time Constant (months):	3.0
Qualification Lead Time Variable (months):	0.7
State-of-Art Factor (N.D.):	1.0

Subsystem: S&C (0301)

Configurations: All

Equipment Type: Sun Sensor Assembly (with electronics) (single axis)

Performance

Technical Characteristics

(1)

(2)

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts):	1.0
Maximum Power (watts):	1.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 0.39 (0.85 lb)

Volume (cc): 280 (0.01 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100^o F)
Minimum (^oK):	255 (0^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI	
Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	4
High Rate Telemetry	
Analog Points (No.):	7
Digital Points (No.):	
Sample Rate (sec^{-1}):	125
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8
Safety	
Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	1500
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	6
Cost	
Design Engineering ($1000):	230.0
Test and Evaluation ($1000):	150.0
Unit Production ($1000):	20.0
Reference Quantity (No.):	2
Factor (N.D.):	1
Schedule	
Development Lead Time Constant (months):	8.0
Development Lead Time Variable (months):	4.9
Qualification Lead Time Constant (months):	8.4
Qualification Lead Time Variable (months):	1.5
State-of-Art Factor (N.D.):	1.0

Subsystem: S&C (0302)

Configurations: All

Equipment Type: Sun Sensor Assembly (with electronics)

Performance

Technical Characteristics

(1)

(2)

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts):	1.0
Maximum Power (watts):	1.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 0.545 (1.2 lb)

Volume (cc): 6.2×10^3 ($0.22\ ft^3$)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100^o F)
Minimum (^oK):	275 (35^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	5
Sample Rate (sec^{-1}):	1
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	1
Sample Rate (sec^{-1}):	0.0075
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	2499
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	6

Cost

Design Engineering ($1000):	290.0
Test and Evaluation ($1000):	173.0
Unit Production ($1000):	8.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	8.0
Development Lead Time Variable (months):	2.0
Qualification Lead Time Constant (months):	8.4
Qualification Lead Time Variable (months):	0.4
State-of-Art Factor (N.D.):	1.0

Subsystem: S&C (0401)

Configurations: Dual Spin

Equipment Type: Nutation Damper

Performance

Technical Characteristics

(1)

(2)

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts): 0

Maximum Power (watts): 0

Minimum Power (watts): 0

Nominal Voltage (volts): 0

Maximum Voltage (volts): 0

Minimum Voltage (volts): 0

Converter/Inverter Requirement (flag):

Weight (kg): 1.8 (4.0 lb)

Volume (cc): 2×10^4 (0.8 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK): 311 (100^o F)

Minimum (^oK): 275 (35^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean (x $10^{\pm 9}$ hr):	172
Standard Deviation (x 10^{+9} hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	3

Cost

Design Engineering ($1000):	155.0
Test and Evaluation ($1000):	25.0
Unit Production ($1000):	9.0
Reference Quantity (No.):	1
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	5.4
Development Lead Time Variable (months):	2.3
Qualification Lead Time Constant (months):	2.2
Qualification Lead Time Variable (months):	0.2
State-of-Art Factor (N.D.):	1.0

Subsystem: S&C (0501)

Configurations: Dual Spin

Equipment Type: Gimbal Electronics Assembly

Performance

Technical Characteristics

(1) Resolver accuracy (3σ): 0.51 mrad (0.029 deg)

(2)

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts):	3.5
Maximum Power (watts):	5.0
Minimum Power (watts):	2.0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 2.83 (6.25 lb)

Volume (cc): 7.9×10^3 (0.28 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100^o F)
Minimum (^oK):	275 (35^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	6
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	2
Sample Rate (sec^{-1}):	1
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	1
Digital Points (No.):	
Sample Rate (sec^{-1}):	0.0075
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	2430
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	3

Cost

Design Engineering ($1000):	0	mission equipment
Test and Evaluation ($1000):	0	
Unit Production ($1000):	0	
Reference Quantity (No.):	1	
Factor (N.D.):	1	

Schedule

Development Lead Time Constant (months):	7.3
Development Lead Time Variable (months):	3.1
Qualification Lead Time Constant (months):	3.8
Qualification Lead Time Variable (months):	0.4
State-of-Art Factor (N.D.):	1.2

Subsystem: S&C (0601)

Configurations: Dual Spin

Equipment Type: Control Timing Assembly

Performance

Technical Characteristics

(1) Programmer sine wave (3σ):	0.93 mrad	(0.053 deg)
(2) Drive quantization and delay (3σ):	0.87 mrad	(0.050 deg)
(3) Measurement compensation (3σ):	0.17 mrad	(0.010 deg)
(4) Pipper drift (3σ):	0.31 mrad	(0.018 deg)
(5) Quantization noise (3σ):	0.12 mrad	(0.007 deg)
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	3.5
Maximum Power (watts):	5.0
Minimum Power (watts):	2.0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 3.4 (7.4 lb)

Volume (cc): 1.04×10^4 ($0.367\ ft^3$)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100^o F)
Minimum (^oK):	275 (35^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	5
Time Tagged Commands (No.):	
Other Commands (No.):	30
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	8
Sample Rate (sec^{-1}):	1
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	1
Sample Rate (sec^{-1}):	0.0075
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	14,582
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	3

Cost

Design Engineering ($1000):	651.0
Test and Evaluation ($1000):	440.0
Unit Production ($1000):	112.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	11.0
Development Lead Time Variable (months):	3.4
Qualification Lead Time Constant (months):	5.5
Qualification Lead Time Variable (months):	0.3
State-of-Art Factor (N.D.):	1.0

Subsystem: S&C (0701)

Configurations: Dual Spin

Equipment Type: Bi-Axial (Gimbal) Drive Assembly (two required per antenna)

Performance

Technical Characteristics

(1) Drive quantization (3σ): 0.28 mrad (0.016 deg)

(2) Gimbal drive error (3σ): 0.44 mrad (0.025 deg)

(3) Biax droop error (3σ): 0.31 mrad (0.018 deg)

(4)

(5)

(6)

(7)

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(9)

(10)

Power

Average Power (watts):	2.8
Maximum Power (watts):	5.6
Minimum Power (watts):	1.4
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 6.44 (14.2 lb)

Volume (cc): 9.9×10^3 (0.35 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^{o}K): 322 (120^{o} F)

Minimum (^{o}K): 266 (20^{o} F)

Pressure (kg/m^2):

Performance (continued)

- CDPI
  - Power Switching Commands (No.):
  - Time Tagged Commands (No.):
  - Other Commands (No.): 2
  - High Rate Telemetry
    - Analog Points (No.):
    - Digital Points (No.):
    - Sample Rate (sec^{-1}):
    - Word Length (bits):
  - Low Rate Telemetry
    - Analog Points (No.): 4
    - Digital Points (No.):
    - Sample Rate (sec^{-1}): 0.0075
    - Word Length (bits): 8

Safety

- Failure Model (flag): 1
- Failure Parameters
  - Failure Rate or Mean ($\times 10^{\pm 9}$ hr): 650
  - Standard Deviation ($\times 10^{+9}$ hr):
  - Dormancy Factor (N.D.): 1.0
- Total Redundant Elements (No.): 1

Cost

Design Engineering ($1000):	0	mission equipment
Test and Evaluation ($1000):	0	
Unit Production ($1000):	0	
Reference Quantity (No.):	1	
Factor (N.D.):	1	

Schedule

- Development Lead Time Constant (months): 7.5
- Development Lead Time Variable (months): 3.2
- Qualification Lead Time Constant (months): 3.9
- Qualification Lead Time Variable (months): 0.4
- State-of-Art Factor (N.D.): 1.2

Subsystem: S&C (0801)

Configurations: Dual Spin

Equipment Type: Non-Scanning Earth Sensor Assembly (with electronics)

Performance

Technical Characteristics

(1)	Sensor noise (3σ):	4.42 mrad (0.253 deg)
(2)	Radiance irregularity (3σ):	0.52 mrad (0.030 deg)
(3)	Quantization error (3σ):	0.12 mrad (0.007 deg)
(4)	Sun interference (3σ):	0.35 mrad (0.020 deg)
(5)	Moon interference (3σ):	0.87 mrad (0.050 deg)
(6)	Threshold aging (3σ):	0.56 mrad (0.032 deg)
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	0.6
Maximum Power (watts):	0.9
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 3.5 (7.7 lb)

Volume (cc): 790 (0.028 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK): 311 (100^o F)

Minimum (^oK): 275 (35^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	14
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	4
Digital Points (No.):	1
Sample Rate (sec^{-1}):	0.0075
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	3212
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	66.0
Test and Evaluation ($1000):	105.0
Unit Production ($1000):	33.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	11.6
Development Lead Time Variable (months):	2.5
Qualification Lead Time Constant (months):	9.4
Qualification Lead Time Variable (months):	4.7
State-of-Art Factor (N.D.):	1.0

Subsystem: S&C (0901)

Configurations: All

Equipment Type: Sun Sensor Assembly (with electronics)

Performance

Technical Characteristics

(1)

(2)

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(10)

Power

Average Power (watts):	1.0
Maximum Power (watts):	1.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 0.545 (1.2 lb)

Volume (cc): 6.2×10^3 ($0.22\ ft^3$)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100^oF)
Minimum (^oK):	275 (35^oF)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	5
Sample Rate (sec^{-1}):	1
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	1
Sample Rate (sec^{-1}):	0.0075
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	2499
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	6

Cost

Design Engineering ($1000):	290.0
Test and Evaluation ($1000):	173.0
Unit Production ($1000):	8.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	8.0
Development Lead Time Variable (months):	2.0
Qualification Lead Time Constant (months):	8.4
Qualification Lead Time Variable (months):	0.4
State-of-Art Factor (N.D.):	1.0

Subsystem: S&C (0902)

Configurations: All

Equipment Type: Sun Sensor Assembly (with electronics) (single axis)

Performance

Technical Characteristics

(1)

(2)

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts):	1.0
Maximum Power (watts):	1.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 0.39 (0.85 lb)

Volume (cc): 280 (0.01 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100^oF)
Minimum (^oK):	255 (0^oF)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	4
High Rate Telemetry	
Analog Points (No.):	7
Digital Points (No.):	
Sample Rate (sec^{-1}):	125
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean (x $10^{\pm 9}$ hr):	1500
Standard Deviation (x 10^{+9} hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	6

Cost

Design Engineering ($1000):	230.0
Test and Evaluation ($1000):	150.0
Unit Production ($1000):	20.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	8.0
Development Lead Time Variable (months):	4.9
Qualification Lead Time Constant (months):	8.4
Qualification Lead Time Variable (months):	1.5
State-of-Art Factor (N.D.):	1.0

Subsystem: S&C (1001)

Configurations: Yaw Spin

Equipment Type: Control Electronics Assembly

Performance

Technical Characteristics

(1)

(2)

(3)

(4)

(5)

(6) Controller error (3σ): 1.789 mrad (0.1025 deg)

(7)

(8)

(9)

(10)

Power

Average Power (watts):	4.0
Maximum Power (watts):	4.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	22.0
Converter/Inverter Requirement (flag):	C 01 (1401)

Weight (kg): 4.14 (9.12 lb)

Volume (cc): 2.5×10^4 (0.9 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	322 (120° F)
Minimum (^oK):	266 (20° F)

Pressure (kg/m^2):

Performance (continued)

CDPI	
Power Switching Commands (No.):	1
Time Tagged Commands (No.):	
Other Commands (No.):	20
High Rate Telemetry	
Analog Points (No.):	9
Digital Points (No.):	
Sample Rate (sec^{-1}):	125
Word Length (bits):	13
Low Rate Telemetry	
Analog Points (No.):	23
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	14
Safety	
Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	10,000
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4
Cost	
Design Engineering ($1000):	750.0
Test and Evaluation ($1000):	500.0
Unit Production ($1000):	130.0
Reference Quantity (No.):	2
Factor (N.D.):	1
Schedule	
Development Lead Time Constant (months):	11.0
Development Lead Time Variable (months):	9.3
Qualification Lead Time Constant (months):	5.5
Qualification Lead Time Variable (months):	1.2
State-of-Art Factor (N.D.):	1.5

Subsystem: S&C (1101)

Configurations: Yaw Spin

Equipment Type: Rate Gyro Assembly

Performance

Technical Characteristics

(1)

(2)

(3)

(4)

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(7)

(8)

(9)

(10)

Power

Average Power (watts):	12.0
Maximum Power (watts):	18.0
Minimum Power (watts):	6.0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	C 01 (1401)

Weight (kg): 1.47 (3.23 lb)

Volume (cc): 2.4×10^3 (0.086 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100^o F)
Minimum (^oK):	278 (40^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI	
Power Switching Commands (No.):	1
Time Tagged Commands (No.):	
Other Commands (No.):	1
High Rate Telemetry	
Analog Points (No.):	1
Digital Points (No.):	
Sample Rate (sec^{-1}):	125
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8
Safety	
Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	11,941
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	3
Cost	
Design Engineering ($1000):	285.0
Test and Evaluation ($1000):	118.0
Unit Production ($1000):	52.0
Reference Quantity (No.):	1
Factor (N.D.):	1
Schedule	
Development Lead Time Constant (months):	11.9
Development Lead Time Variable (months):	3.4
Qualification Lead Time Constant (months):	3.9
Qualification Lead Time Variable (months):	0.4
State-of-Art Factor (N.D.):	1.0

Subsystem: S&C (1201)

Configurations: All except Dual Spin

Equipment Type: Horizon Sensor (with electronics) (Planar scan type)

Performance

Technical Characteristics

(1)	Sensor noise (3σ):	4.36 mrad (0.250 deg)
(2)	Radiance irregularity (3σ):	2.62 mrad (0.150 deg)
(3)	Quantization error (3σ):	0.44 mrad (0.025 deg)
(4)	Sun interference (3σ):	
(5)	Moon interference (3σ):	
(6)	Threshold aging (3σ):	
(7)	Null or bias error (3σ):	
(8)	Maximum output frequency:	1.256 rad/sec
(9)		
(10)		

Power

Average Power (watts):	5.5
Maximum Power (watts):	8.0
Minimum Power (watts):	2.5
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	C 01 (1401)

Weight (kg): 2.87 (6.33 lb)

Volume (cc): 4.2×10^3 (0.15 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100^o F)
Minimum (^oK):	255 (0^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	1
Time Tagged Commands (No.):	
Other Commands (No.):	1
High Rate Telemetry	
Analog Points (No.):	18
Digital Points (No.):	
Sample Rate (sec^{-1}):	125
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	5166
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	1250.0
Test and Evaluation ($1000):	355.0
Unit Production ($1000):	105.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	11.6
Development Lead Time Variable (months):	9.9
Qualification Lead Time Constant (months):	9.4
Qualification Lead Time Variable (months):	4.2
State-of-Art Factor (N.D.):	1.0

Subsystem: S&C (1301)

Configurations: Yaw Spin and ME with Momentum Wheel

Equipment Type: Reaction Wheel Assembly (with electronics)

Performance

Technical Characteristics

(1)	Nominal momentum:	42.58 m-kg-sec (308.0 ft-lb-sec)
(2)	Maximum momentum:	51.10 m-kg-sec (369.6 ft-lb-sec)
(3)	Minimum momentum:	34.07 m-kg-sec (246.4 ft-lb-sec)
(4)	Nominal speed:	3000 rpm
(5)	Maximum speed:	3600 rpm
(6)	Minimum speed:	2400 rpm
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	19.6
Maximum Power (watts):	125.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	33.0
Minimum Voltage (volts):	21.5
Converter/Inverter Requirement (flag):	C 01 (1401)

Weight (kg): 35.54 (78.35 lb)

Volume (cc): 7.1×10^4 (2.5 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	316 (110^o F)
Minimum (^oK):	272 (30^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	1
Time Tagged Commands (No.):	
Other Commands (No.):	1
High Rate Telemetry	
Analog Points (No.):	5
Digital Points (No.):	
Sample Rate (sec^{-1}):	125
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	7
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	500
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	3

Cost

Design Engineering ($1000):	430.0
Test and Evaluation ($1000):	390.0
Unit Production ($1000):	122.0
Reference Quantity (No.):	1
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	7.1
Development Lead Time Variable (months):	3.0
Qualification Lead Time Constant (months):	3.2
Qualification Lead Time Variable (months):	0.4
State-of-Art Factor (N.D.):	1.0

Subsystem: S&C (1401)

Configurations: All

Equipment Type: Power Converter

Performance

Technical Characteristics

(1) Special requirement code: C 01

(2)

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(10)

Power

Average Power (watts):	10.6
Maximum Power (watts):	15.0
Minimum Power (watts):	7.5
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	22.0
Converter/Inverter Requirement (flag):	

Weight (kg): 2.31 (5.09 lb)

Volume (cc): 5.1×10^3 (0.18 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100^o F)
Minimum (^oK):	266 (20^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	7
Time Tagged Commands (No.):	
Other Commands (No.):	3
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	7
Digital Points (No.):	6
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean (x $10^{\pm 9}$ hr):	4033
Standard Deviation (x 10^{+9} hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	0	CER
Test and Evaluation ($1000):	0	
Unit Production ($1000):	0	
Reference Quantity (No.):	1	
Factor (N.D.):	1	

Schedule

Development Lead Time Constant (months):	7.4
Development Lead Time Variable (months):	3.2
Qualification Lead Time Constant (months):	2.5
Qualification Lead Time Variable (months):	0.3
State-of-Art Factor (N.D.):	1.0

Subsystem: S&C (1501)

Configurations: Mass Expulsion

Equipment Type: Attitude Reference Electronics (3 axis gyrocompassing)

Performance

Technical Characteristics

(1)	Pitch horizon scanner gain:	0.01667 sec^{-1}
(2)	Roll horizon scanner gain to roll axis:	0.00556 sec^{-1}
(3)	Roll horizon scanner gain to yaw axis:	0.01667 sec^{-1}
(4)	Pitch feedback gain:	0.01667 sec^{-1}
(5)	Roll feedback gain:	0.00556 sec^{-1}
(6)	Roll to yaw coupling gain:	0.01667 sec^{-1}
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	4.0
Maximum Power (watts):	6.0
Minimum Power (watts):	2.0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 4.5 (10.0 lb)

Volume (cc): 2.8×10^4 (1.0 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	322 (120° F)
Minimum (^oK):	266 (20° F)

Pressure (kg/m^2):

Performance (continued)	
CDPI	
Power Switching Commands (No.):	1
Time Tagged Commands (No.):	
Other Commands (No.):	20
High Rate Telemetry	
Analog Points (No.):	9
Digital Points (No.):	
Sample Rate (sec^{-1}):	125
Word Length (bits):	13
Low Rate Telemetry	
Analog Points (No.):	23
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	14
Safety	
Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	10,000
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4
Cost	
Design Engineering ($1000):	800.0
Test and Evaluation ($1000):	530.0
Unit Production ($1000):	137.0
Reference Quantity (No.):	2
Factor (N.D.):	1
Schedule	
Development Lead Time Constant (months):	11.0
Development Lead Time Variable (months):	9.5
Qualification Lead Time Constant (months):	5.5
Qualification Lead Time Variable (months):	1.3
State-of-Art Factor (N.D.):	1.0

Subsystem: S&C (1601)

Configurations: All

Equipment Type: Valve Driver Assembly

Performance

Technical Characteristics

(1) Number of valves: 6

(2)

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts): 1.0

Maximum Power (watts): 12.0

Minimum Power (watts): 0

Nominal Voltage (volts): 28.0

Maximum Voltage (volts): 32.0

Minimum Voltage (volts): 24.0

Converter/Inverter Requirement (flag):

Weight (kg): 0.73 (1.6 lb)

Volume (cc): 4.5×10^3 (0.16 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK): 322 (120^o F)

Minimum (^oK): 266 (20^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	2
Time Tagged Commands (No.):	
Other Commands (No.):	8
High Rate Telemetry	
Analog Points (No.):	13
Digital Points (No.):	
Sample Rate (sec^{-1}):	125
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	4
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	1900
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	40.0
Test and Evaluation ($1000):	30.0
Unit Production ($1000):	10.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	2.6
Development Lead Time Variable (months):	1.1
Qualification Lead Time Constant (months):	3.0
Qualification Lead Time Variable (months):	0.3
State-of-Art Factor (N.D.):	1.0

Subsystem: S&C (1602)

Configurations: All

Equipment Type: Valve Driver Assembly
(3 assemblies for 6 valves)

Performance

Technical Characteristics

(1) Number of valves: 6

(2)

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts): 0.12

Maximum Power (watts): 27.0

Minimum Power (watts): 0

Nominal Voltage (volts): 28.0

Maximum Voltage (volts): 32.0

Minimum Voltage (volts): 24.0

Converter/Inverter Requirement (flag):

Weight (kg): 1.9 (4.2 lb)

Volume (cc): 1.2×10^4 ($0.42\ ft^3$)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK): 322 (120^oF)

Minimum (^oK): 266 (20^oF)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	3
Sample Rate (sec^{-1}):	1
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	966
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	164.0
Test and Evaluation ($1000):	15.0
Unit Production ($1000):	21.0
Reference Quantity (No.):	1
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	2.6
Development Lead Time Variable (months):	2.0
Qualification Lead Time Constant (months):	3.0
Qualification Lead Time Variable (months):	0.7
State-of-Art Factor (N.D.):	1.0

Subsystem: S&C (1701)

Configurations: All Mass Expulsion Configurations

Equipment Type: Rate Integrating Gyro Assembly (with electronics) (3 gyros per assembly)

Performance

Technical Characteristics

(1)	G-insensitive gyro drift (3σ):	2.43×10^{-3} mrad/sec	(0.000139 deg/sec)
(2)	Total misalignment relative to vehicle (3σ):	0.87×10^{-3} mrad	(0.05 deg)
(3)	Gyro scale factor error (N.D):	0.02×10^{-3}	(0.001)
(4)			
(5)			
(6)			
(7)			
(8)			
(9)			
(10)			

Power

Average Power (watts):	18.0
Maximum Power (watts):	27.0
Minimum Power (watts):	9.0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 6.8 (15.0 lb)

Volume (cc): 8.5×10^3 ($0.3\ ft^3$)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100^o F)
Minimum (^oK):	278 (40^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI	
Power Switching Commands (No.):	1
Time Tagged Commands (No.):	
Other Commands (No.):	1
High Rate Telemetry	
Analog Points (No.):	3
Digital Points (No.):	
Sample Rate (sec^{-1}):	125
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	6
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8
Safety	
Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	15,000
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	4
Cost	
Design Engineering ($1000):	742.0
Test and Evaluation ($1000):	355.0
Unit Production ($1000):	151.0
Reference Quantity (No.):	1
Factor (N.D.):	1
Schedule	
Development Lead Time Constant (months):	10.5
Development Lead Time Variable (months):	4.5
Qualification Lead Time Constant (months):	8.3
Qualification Lead Time Variable (months):	0.9
State-of-Art Factor (N.D.):	1.0

Subsystem: S&C (1702)

Configurations: All Mass Expulsion Configurations

Equipment Type: Rate Integrating Gyro Assembly (with electronics)

Performance

Technical Characteristics

(1)	G-insensitive gyro drift (3σ):	2.41×10^{-4} mrad/sec (0.0000138 deg/sec)
(2)	Total misalignment relative to vehicle (3σ):	0.87 mrad (0.05 deg)
(3)	Gyro scale factor error (N.D.):	0.002 (0.0001)
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	27.0
Maximum Power (watts):	36.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 10.4 (23.0 lb)

Volume (cc): 1.2×10^4 (0.41 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum ($^\circ$K):	311 (100° F)
Minimum ($^\circ$K):	278 (40° F)

Pressure (kg/m^2):

Performance (continued)

CDPI	
Power Switching Commands (No.):	1
Time Tagged Commands (No.):	
Other Commands (No.):	1
High Rate Telemetry	
Analog Points (No.):	3
Digital Points (No.):	
Sample Rate (sec^{-1}):	125
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	6
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8
Safety	
Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	15,000
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	4
Cost	
Design Engineering ($1000):	970.0
Test and Evaluation ($1000):	480.0
Unit Production ($1000):	205.0
Reference Quantity (No.):	1
Factor (N.D.):	1
Schedule	
Development Lead Time Constant (months):	10.5
Development Lead Time Variable (months):	3.0
Qualification Lead Time Constant (months):	8.3
Qualification Lead Time Variable (months):	0.6
State-of-Art Factor (N.D.):	1.0

Subsystem: S&C (1801)

Configurations: All except Dual Spin

Equipment Type: Horizon Sensor (with electronics)

Performance

Technical Characteristics

(1)	Sensor noise (3σ):	4.36 mrad (0.250 deg)
(2)	Radiance irregularity (3σ):	0.52 mrad (0.030 deg)
(3)	Quantization error (deg, 3σ):	
(4)	Sun interference (3σ):	0.35 mrad (0.020 deg)
(5)	Moon interference (3σ):	0.87 mrad (0.050 deg)
(6)	Threshold aging (3σ):	0.56 mrad (0.032 deg)
(7)	Null or bias error (deg, 3σ):	
(8)	Maximum output frequency:	1.256 rad/sec
(9)		
(10)		

Power

Average Power (watts):	15.0
Maximum Power (watts):	20.0
Minimum Power (watts):	10.0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 9.1 (20.0 lb)

Volume (cc): 5.7×10^4 ($2.0\ ft^3$)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100^o F)
Minimum (^oK):	255 (-0^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	1
Time Tagged Commands (No.):	
Other Commands (No.):	1
High Rate Telemetry	
Analog Points (No.):	18
Digital Points (No.):	
Sample Rate (sec^{-1}):	125
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	10,000
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	3

Cost

Design Engineering ($1000):	2210.0
Test and Evaluation ($1000):	760.0
Unit Production ($1000):	250.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	11.6
Development Lead Time Variable (months):	14.7
Qualification Lead Time Constant (months):	9.4
Qualification Lead Time Variable (months):	7.6
State-of-Art Factor (N.D.):	1.0

Subsystem: S&C (1802)

Configurations: All except Dual Spin

Equipment Type: Horizon Sensor (with electronics) (Planar scan type)

Performance

Technical Characteristics

(1)	Sensor noise (3σ):	4.36 mrad (0.250 deg)
(2)	Radiance irregularity (3σ):	2.62 mrad (0.150 deg)
(3)	Quantization error (3σ):	0.44 mrad (0.025 deg)
(4)	Sun interference (3σ):	
(5)	Moon interference (3σ):	
(6)	Threshold aging (3σ):	
(7)	Null or bias error (3σ):	
(8)	Maximum output frequency:	1.256 rad/sec
(9)		
(10)		

Power

Average Power (watts):	5.5
Maximum Power (watts):	8.0
Minimum Power (watts):	2.5
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	C 01 (1401)

Weight (kg): 2.87 (6.33 lb)

Volume (cc): 4.2×10^3 ($0.15\ ft^3$)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100^oF)
Minimum (^oK):	255 (0^oF)

Pressure (kg/m^2):

Performance (continued)

CDPI	
Power Switching Commands (No.):	1
Time Tagged Commands (No.):	
Other Commands (No.):	1
High Rate Telemetry	
Analog Points (No.):	18
Digital Points (No.):	
Sample Rate (sec^{-1}):	125
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8
Safety	
Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	5166
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4
Cost	
Design Engineering ($1000):	1250.0
Test and Evaluation ($1000):	355.0
Unit Production ($1000):	105.0
Reference Quantity (No.):	2
Factor (N.D.):	1
Schedule	
Development Lead Time Constant (months):	11.6
Development Lead Time Variable (months):	9.9
Qualification Lead Time Constant (months):	9.4
Qualification Lead Time Variable (months):	4.2
State-of-Art Factor (N.D.):	1.0

Subsystem: S&C (1901)

Configurations: Mass Expulsion with Control Moment Gyros

Equipment Type: Electronic Processor Assembly

Performance

Technical Characteristics

(1)

(2)

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts):	26.5
Maximum Power (watts):	30.0
Minimum Power (watts):	15.0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 4.67 (10.3 lb)

Volume (cc): 2.92×10^4 ($1.03\ ft^3$)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	322 (120^o F)
Minimum (^oK):	266 (20^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	2
Time Tagged Commands (No.):	
Other Commands (No.):	40
High Rate Telemetry	
Analog Points (No.):	18
Digital Points (No.):	
Sample Rate (sec^{-1}):	125
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	46
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	14

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	6000
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	810.0
Test and Evaluation ($1000):	520.0
Unit Production ($1000):	140.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	11.0
Development Lead Time Variable (months):	4.7
Qualification Lead Time Constant (months):	5.5
Qualification Lead Time Variable (months):	0.6
State-of-Art Factor (N.D.):	2.0

Subsystem: S&C (2001)

Configurations: Mass Expulsion with Control Moment Gyros

Equipment Type: Single Gimbaled Control Moment Gyro

Performance

Technical Characteristics

(1)	CMG momentum:	69.1 m-kg-sec (500 ft-lb-sec)
(2)	Peak gimbal rate:	1 rad/sec
(3)	Peak torquer torque:	85.4 N-m (63 ft-lb)
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	30.8
Maximum Power (watts):	100.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 77.1 (170.0 lb)

Volume (cc): 1.7×10^5 (6.0 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100^o F)
Minimum (^oK):	278 (40^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	2
Time Tagged Commands (No.):	
Other Commands (No.):	2
High Rate Telemetry	
Analog Points (No.):	6
Digital Points (No.):	
Sample Rate (sec^{-1}):	125
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	12
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	870
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	12

Cost

Design Engineering ($1000):	2000.0
Test and Evaluation ($1000):	1500.0
Unit Production ($1000):	1000.0
Reference Quantity (No.):	4
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	24.0
Development Lead Time Variable (months):	10.0
Qualification Lead Time Constant (months):	8.0
Qualification Lead Time Variable (months):	4.8
State-of-Art Factor (N.D.):	2.0

Subsystem: S&C (2101)

Configurations: Mass Expulsion with Control Moment Gyros

Equipment Type: Star Sensor Assembly (with electronics)

Performance

Technical Characteristics

(1)	Type	1
(2)	Sensor accuracy (3σ):	1.7 mrad (0.1 deg)
(3)	Mapper field of view:	30.5 $mrad^2$ (100 deg^2)
(4)	Mapper sensitivity (visual magnitude):	2
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	5.5
Maximum Power (watts):	7.0
Minimum Power (watts):	3.0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 3.2 (7.0 lb)

Volume (cc): 1.5×10^4 (0.53 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum ($^\circ$K): 322 (120° F)

Minimum ($^\circ$K): 266 (20° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	1
Time Tagged Commands (No.):	
Other Commands (No.):	1
High Rate Telemetry	
Analog Points (No.):	18
Digital Points (No.):	
Sample Rate (sec^{-1}):	125
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean (x $10^{\pm 9}$ hr):	3000
Standard Deviation (x 10^{+9} hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	3

Cost

Design Engineering ($1000):	420.0
Test and Evaluation ($1000):	625.0
Unit Production ($1000):	115.0
Reference Quantity (No.):	1
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	10.0
Development Lead Time Variable (months):	8.0
Qualification Lead Time Constant (months):	7.0
Qualification Lead Time Variable (months):	1.6
State-of-Art Factor (N.D.):	1.5

Subsystem: S&C (2102)

Configurations: Mass Expulsion with Control Moment Gyros

Equipment Type: Star Sensor Assembly (with electronics)

Performance

Technical Characteristics

(1)	Type:	2
(2)	Sensor accuracy (3σ):	0.87 mrad (0.05 deg)
(3)	Mapper field of view:	122 rad^2 (400 deg^2)
(4)	Mapper sensitivity (visual magnitude):	4
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	5.0
Maximum Power (watts):	10.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg):	7.03 (15.5 lb)
Volume (cc):	4.39×10^4 (1.55 ft^3)

Vibration

Random (g, rms):	
Non-Random (g):	

Temperature

Maximum (^oK):	322 (120^{o}F)
Minimum (^oK):	266 (20^{o}F)

Pressure (kg/m^2):

Performance (continued)

CDPI	
Power Switching Commands (No.):	1
Time Tagged Commands (No.):	
Other Commands (No.):	1
High Rate Telemetry	
Analog Points (No.):	18
Digital Points (No.):	
Sample Rate (sec^{-1}):	125
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8
Safety	
Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean (x $10^{\pm 9}$ hr):	3000
Standard Deviation (x 10^{+9} hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	3
Cost	
Design Engineering ($1000):	600.0
Test and Evaluation ($1000):	800.0
Unit Production ($1000):	175.0
Reference Quantity (No.):	1
Factor (N.D.):	1
Schedule	
Development Lead Time Constant (months):	10.0
Development Lead Time Variable (months):	8.0
Qualification Lead Time Constant (months):	7.0
Qualification Lead Time Variable (months):	1.6
State-of-Art Factor (N.D.):	1.5

Subsystem: S&C (2103)

Configurations: Mass Expulsion with Control Moment Gyros

Equipment Type: Star Sensor Assembly (with electronics)

Performance

Technical Characteristics

(1)	Type:	3
(2)	Sensor accuracy (3σ):	0.05 mrad (0.003 deg)
(3)	Mapper field of view:	8.54 rad^2 (28 deg^2)
(4)	Mapper sensitivity (visual magnitude):	6
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	8.0
Maximum Power (watts):	12.0
Minimum Power (watts):	4.0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 10.4 (23.0 lb)

Volume (cc): 1.4×10^4 (0.49 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	322 (120^o F)
Minimum (^oK):	266 (20^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI	
Power Switching Commands (No.):	1
Time Tagged Commands (No.):	
Other Commands (No.):	1
High Rate Telemetry	
Analog Points (No.):	18
Digital Points (No.):	
Sample Rate (sec^{-1}):	125
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8
Safety	
Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	10,000
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	3
Cost	
Design Engineering ($1000):	750.0
Test and Evaluation ($1000):	1000.0
Unit Production ($1000):	225.0
Reference Quantity (No.):	1
Factor (N.D.):	1
Schedule	
Development Lead Time Constant (months):	10.0
Development Lead Time Variable (months):	8.0
Qualification Lead Time Constant (months):	7.0
Qualification Lead Time Variable (months):	1.6
State-of-Art Factor (N.D.):	1.5

Subsystem: S&C (2201)

Configurations: Mass Expulsion with Momentum Wheel

Equipment Type: Electronic Error Processor

Performance

Technical Characteristics

(1)

(2)

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts):	4.0
Maximum Power (watts):	6.0
Minimum Power (watts):	2.0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 4.5 (10.0 lb)

Volume (cc): 2.8×10^4 (1.0 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	322 (120^o F)
Minimum (^oK):	266 (20^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	1
Time Tagged Commands (No.):	
Other Commands (No.):	20
High Rate Telemetry	
Analog Points (No.):	9
Digital Points (No.):	
Sample Rate (sec^{-1}):	125
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	23
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	23,000
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	800.0
Test and Evaluation ($1000):	530.0
Unit Production ($1000):	138.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	11.0
Development Lead Time Variable (months):	9.0
Qualification Lead Time Constant (months):	5.5
Qualification Lead Time Variable (months):	1.2
State-of-Art Factor (N.D.):	1.5

2.2
AUXILIARY PROPULSION

Subsystem: APS (0101)

Configurations: Cold Gas

Equipment Type: Thruster (Fairchild 683000)

Performance

Technical Characteristics

(1)	Thrust level:	0.22 N (0.05 lb)
(2)	Pulse life:	150,000 cycles
(3)	Inlet pressure:	2.9×10^5 N/m^2 (42 psia)
(4)	Total impulse (lb-sec)*:	
(5)	ISP (sec)*:	
(6)	Mixture ratio (N.D.)**:	
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	1.0
Maximum Power (watts):	25.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg):	0.34 (0.75 lb)
Volume (cc):	2.1×10^3 (0.075 ft^3)

Vibration

Random (g, rms):	22.3
Non-Random (g):	

Temperature

Maximum ($^\circ$K):	339 (150° F)
Minimum ($^\circ$K):	211 (-80° F)

Pressure (kg/m^2):

*Applicable to monopropellant and bipropellant thrusters
**Applicable to bipropellant thrusters only

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	5
Failure Parameters	
Failure Rate or Mean (x $10^{\pm 9}$ hr):	300
Standard Deviation (x 10^{+9} hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	16

Cost

Design Engineering ($1000):	121.0
Test and Evaluation ($1000):	30.0
Unit Production ($1000):	9.0
Reference Quantity (No.):	3
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	2.5
Development Lead Time Variable (months):	1.0
Qualification Lead Time Constant (months):	1.0
Qualification Lead Time Variable (months):	0.1
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0102)

Configurations: Cold Gas

Equipment Type: Thruster (Hydraulic Research 48001770)

Performance

Technical Characteristics

(1)	Thrust level:	0.22 N (0.05 lb)
(2)	Pulse life:	250,000 cycles
(3)	Inlet pressure:	6.89×10^5 N/m^2 (100 psia)
(4)	Total impulse (lb-sec)*:	
(5)	ISP (sec)*:	
(6)	Mixture ratio (N.D.)**:	
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	1.0
Maximum Power (watts):	25.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 0.14 (0.3 lb)

Volume (cc): 850 (0.03 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum ($^\circ$K):	339 (150° F)
Minimum ($^\circ$K):	233 (-40° F)

Pressure (kg/m^2):

*Applicable to monopropellant and bipropellant thrusters
**Applicable to bipropellant thrusters only

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	5
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	300
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	16

Cost

Design Engineering ($1000):	61.0
Test and Evaluation ($1000):	15.0
Unit Production ($1000):	4.2
Reference Quantity (No.):	3
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	2.5
Development Lead Time Variable (months):	0.7
Qualification Lead Time Constant (months):	1.0
Qualification Lead Time Variable (months):	0.1
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0103)

Configurations: Cold Gas

Equipment Type: Thruster (Sterer 51350)

Performance

Technical Characteristics

(1)	Thrust level:	0.22 N (0.05 lb)
(2)	Pulse life:	500,000 cycles
(3)	Inlet pressure:	2.9×10^5 N/m^2 (42 psia)
(4)	Total impulse (lb-sec)*:	
(5)	ISP (sec)*:	
(6)	Mixture ratio (N.D.)**:	
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	1.0
Maximum Power (watts):	11.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg):	0.2 (0.4 lb)
Volume (cc):	1.1×10^3 (0.04 ft^3)

Vibration

Random (g, rms):	7.28
Non-Random (g):	

Temperature

Maximum ($^\circ$K):	344 (160° F)
Minimum ($^\circ$K):	233 (-40° F)

Pressure (kg/m^2):

*Applicable to monopropellant and bipropellant thrusters
**Applicable to bipropellant thrusters only

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	5
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	300
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	16

Cost

Design Engineering ($1000):	75.0
Test and Evaluation ($1000):	19.0
Unit Production ($1000):	5.5
Reference Quantity (No.):	3
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	2.5
Development Lead Time Variable (months):	0.7
Qualification Lead Time Constant (months):	1.0
Qualification Lead Time Variable (months):	0.1
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0104)

Configurations: Cold Gas

Equipment Type: Thruster (Sterer 51340)

Performance

Technical Characteristics

(1)	Thrust level:	13 N (3.0 lb)
(2)	Pulse life:	10,000 cycles
(3)	Inlet pressure:	1.38×10^6 N/m^2 (200 psia)
(4)	Total impulse (lb-sec)*:	
(5)	ISP (sec)*:	
(6)	Mixture ratio (N.D.)**:	
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	1.0
Maximum Power (watts):	40.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 0.3 (0.7 lb)

Volume (cc): 2.0×10^3 (0.07 ft^3)

Vibration

Random (g, rms):	7.5
Non-Random (g):	

Temperature

Maximum ($^\circ$K):	353 (176° F)
Minimum ($^\circ$K):	255 (0° F)

Pressure (kg/m^2):

*Applicable to monopropellant and bipropellant thrusters
**Applicable to bipropellant thrusters only

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	5
Failure Parameters	
Failure Rate or Mean (x $10^{\pm 9}$ hr):	300
Standard Deviation (x 10^{+9} hr):	
Dormancy Factor (N.D.):	1
Total Redundant Elements (No.):	16

Cost

Design Engineering ($1000):	115.0
Test and Evaluation ($1000):	115.0
Unit Production ($1000):	8.7
Reference Quantity (No.):	3
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	2.5
Development Lead Time Variable (months):	1.0
Qualification Lead Time Constant (months):	1.0
Qualification Lead Time Variable (months):	0.1
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0105)

Configurations: Cold Gas

Equipment Type: Thruster (Valcor 27200-511)

Performance

Technical Characteristics

(1)	Thrust level:	13 N (3.0 lb)
(2)	Pulse life:	5,000 cycles
(3)	Inlet pressure:	3.1×10^5 N/m^2 (45 psia)
(4)	Total impulse (lb-sec)*:	
(5)	ISP (sec)*:	
(6)	Mixture ratio (N.D.)**:	
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	1.0
Maximum Power (watts):	32.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg):	0.45 (1.0 lb)
Volume (cc):	2.8×10^3 (0.1 ft^3)

Vibration

Random (g, rms):	18.5
Non-Random (g):	

Temperature

Maximum ($^\circ$K):	344 (160° F)
Minimum ($^\circ$K):	239 (-30° F)

Pressure (kg/m^2):

*Applicable to monopropellant and bipropellant thrusters
**Applicable to bipropellant thrusters only

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	5
Failure Parameters	
Failure Rate or Mean (x $10^{\pm 9}$ hr):	300
Standard Deviation (x 10^{+9} hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	16

Cost

Design Engineering ($1000):	150.0
Test and Evaluation ($1000):	150.0
Unit Production ($1000):	11.5
Reference Quantity (No.):	3
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	2.5
Development Lead Time Variable (months):	1.1
Qualification Lead Time Constant (months):	1.0
Qualification Lead Time Variable (months):	0.1
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0106)

Configurations: Cold Gas

Equipment Type: Thruster (Sterer 51330)

Performance

Technical Characteristics

(1)	Thrust level:	66.7 N (15.0 lb)
(2)	Pulse life:	10,000 cycles
(3)	Inlet pressure:	1.38×10^6 N/m^2 (200 psia)
(4)	Total impulse (lb-sec)*:	
(5)	ISP (sec)*:	
(6)	Mixture ratio (N.D.)**:	
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	1.0
Maximum Power (watts):	32.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 0.64 (1.4 lb)

Volume (cc): 4.0×10^3 (0.14 ft^3)

Vibration

Random (g, rms):	6.1
Non-Random (g):	

Temperature

Maximum ($^\circ$K):	366 (200° F)
Minimum ($^\circ$K):	233 (-40° F)

Pressure (kg/m^2):

*Applicable to monopropellant and bipropellant thrusters
**Applicable to bipropellant thrusters only

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	5
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	300
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	16

Cost

Design Engineering ($1000):	193.0
Test and Evaluation ($1000):	193.0
Unit Production ($1000):	15.0
Reference Quantity (No.):	3
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	2.5
Development Lead Time Variable (months):	1.2
Qualification Lead Time Constant (months):	1.0
Qualification Lead Time Variable (months):	0.1
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0107)

Configurations: Cold Gas

Equipment Type: Thruster (Kidde 872458)

Performance

Technical Characteristics

(1)	Thrust level:	133 N (30.0 lb)
(2)	Pulse life:	20,000 cycles
(3)	Inlet pressure:	2.24×10^7 N/m^2 (3250 psia)
(4)	Total impulse (lb-sec)*:	
(5)	ISP (sec)*:	
(6)	Mixture ratio (N.D.)**:	
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	1.0
Maximum Power (watts):	34.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 1.3 (2.8 lb)

Volume (cc): 8.5×10^3 (0.3 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum ($^\circ$K):	344 (160° F)
Minimum ($^\circ$K):	219 (-65° F)

Pressure (kg/m^2):

*Applicable to monopropellant and bipropellant thrusters
**Applicable to bipropellant thrusters only

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	5
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	300
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	16

Cost

Design Engineering ($1000):	324.0
Test and Evaluation ($1000):	324.0
Unit Production ($1000):	26.0
Reference Quantity (No.):	3
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	2.5
Development Lead Time Variable (months):	1.5
Qualification Lead Time Constant (months):	1.0
Qualification Lead Time Variable (months):	0.2
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0108)

Configurations: Cold Gas

Equipment Type: Thruster (Sterer 31980)

Performance

Technical Characteristics

(1)	Thrust level:	133 N (30.0 lb)
(2)	Pulse life:	100,000 cycles
(3)	Inlet pressure:	1.38×10^7 N/m^2 (2000 psia)
(4)	Total impulse (lb-sec)*:	
(5)	ISP (sec)*:	
(6)	Mixture ratio (N.D.)**:	
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	1.0
Maximum Power (watts):	37.0
Minimum Power (watts):	0.
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 0.95 (2.1 lb)

Volume (cc): 5.9×10^3 (0.21 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum ($^\circ$K):	344 (160° F)
Minimum ($^\circ$K):	233 (-40° F)

Pressure (kg/m^2):

*Applicable to monopropellant and bipropellant thrusters
**Applicable to bipropellant thrusters only

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	

Safety

Failure Model (flag):	5
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	300
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	16

Cost

Design Engineering ($1000):	261.0
Test and Evaluation ($1000):	261.0
Unit Production ($1000):	20.8
Reference Quantity (No.):	3
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	2.5
Development Lead Time Variable (months):	1.6
Qualification Lead Time Constant (months):	1.0
Qualification Lead Time Variable (months):	0.2
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0109)

Configurations: Cold Gas

Equipment Type: Thruster (Valcor 27200)

Performance

Technical Characteristics

(1)	Thrust level:	133 N (30.0 lb)
(2)	Pulse life:	5000 cycles
(3)	Inlet pressure:	2.068×10^7 N/m^2 (3000 psia)
(4)	Total impulse (lb-sec)*:	
(5)	ISP (sec)*:	
(6)	Mixture ratio (N.D.)**:	
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	1.0
Maximum Power (watts):	45.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 0.23 (0.51 lb)

Volume (cc): 5.7×10^3 (0.2 ft^3)

Vibration

Random (g, rms):	18.5
Non-Random (g):	

Temperature

Maximum ($^\circ$K):	344 (160° F)
Minimum ($^\circ$K):	219 (-65° F)

Pressure (kg/m^2):

*Applicable to monopropellant and bipropellant thrusters
**Applicable to bipropellant thrusters only

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	5
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	300
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	16

Cost

Design Engineering ($1000):	91.0
Test and Evaluation ($1000):	91.0
Unit Production ($1000):	6.8
Reference Quantity (No.):	3
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	2.5
Development Lead Time Variable (months):	1.6
Qualification Lead Time Constant (months):	1.0
Qualification Lead Time Variable (months):	0.2
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0201)

Configurations: Cold Gas

Equipment Type: Isolation Valve (latching solenoid) (Valcor 272000-454)

Performance

Technical Characteristics

(1)	Maximum pressure:	2.413×10^7 N/m^2 (3500 psia)
(2)	Flow area:	1.6×10^{-2} cm^2 (0.0025 in^2)
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	0
Maximum Power (watts):	30.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 0.23 (0.50 lb)

Volume (cc): 1.4×10^3 (0.05 ft^3)

Vibration

Random (g, rms):	18.5
Non-Random (g):	

Temperature

Maximum ($^\circ$K):	333 (140° F)
Minimum ($^\circ$K):	233 (-40° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	1	
Failure Parameters		
Failure Rate or Mean (x $10^{\pm 9}$ hr):	70	
Standard Deviation (x 10^{+9} hr):		
Dormancy Factor (N.D.):	1.0	
Total Redundant Elements (No.):	1	

Cost

Design Engineering ($1000):	0	CER
Test and Evaluation ($1000):	0	
Unit Production ($1000):	0	
Reference Quantity (No.):	1	
Factor (N.D.):	1	

Schedule

Development Lead Time Constant (months):	0
Development Lead Time Variable (months):	0
Qualification Lead Time Constant (months):	0
Qualification Lead Time Variable (months):	0
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0202)

Configurations: Cold Gas

Equipment Type: Isolation Valve (latching solenoid) (Sterer 51570)

Performance

Technical Characteristics

(1)	Maximum pressure:	3.172×10^7 N/m^2 (4600 psia)
(2)	Flow area:	0.12 cm^2 (0.018 in^2)
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	0
Maximum Power (watts):	51.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 1.1 (2.5 lb)

Volume (cc): 7.1×10^3 (0.25 ft^3)

Vibration

Random (g, rms):	7.3
Non-Random (g):	

Temperature

Maximum ($^\circ$K):	339 (150° F)
Minimum ($^\circ$K):	233 (-40° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	70
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	1

Cost

Design Engineering ($1000):	0	CER
Test and Evaluation ($1000):	0	
Unit Production ($1000):	0	
Reference Quantity (No.):	1	
Factor (N.D.):	1	

Schedule

Development Lead Time Constant (months):	0
Development Lead Time Variable (months):	0
Qualification Lead Time Constant (months):	0
Qualification Lead Time Variable (months):	0
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0203)

Configurations: Cold Gas

Equipment Type: Isolation Valve (pyrotechnic) (Pyrotechnics 1436-7)

Performance

Technical Characteristics

(1)	Maximum pressure:	2.413 x 10^7 N/m^2 (3500 psia)
(2)	Flow area:	0.14 cm^2 (0.022 in^2)
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	0
Maximum Power (watts):	12.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 0.16 (0.35 lb)

Volume (cc): 1.1 x 10^3 (0.04 ft^3)

Vibration

Random (g, rms):	16.9
Non-Random (g):	

Temperature

Maximum (^oK):	344 (160^o F)
Minimum (^oK):	219 (-65^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):

Failure Parameters

Failure Rate or Mean (x $10^{\pm 9}$ hr): 100

Standard Deviation (x 10^{+9} hr):

Dormancy Factor (N.D.): 1.0

Total Redundant Elements (No.): 1

Cost

Design Engineering ($1000):	0	CER
Test and Evaluation ($1000):	0	
Unit Production ($1000):	0	
Reference Quantity (No.):	1	
Factor (N.D.):	1	

Schedule

Development Lead Time Constant (months): 0

Development Lead Time Variable (months): 0

Qualification Lead Time Constant (months): 0

Qualification Lead Time Variable (months): 0

State-of-Art Factor (N.D.): 1.0

Subsystem: APS (0204)

Configurations: Cold Gas

Equipment Type: Isolation Valve (latching solenoid) (Valcor V27700)

Performance

Technical Characteristics

(1)	Maximum pressure:	2.069×10^7 N/m^2 (3000 psia)
(2)	Flow area:	23.6 cm^2 (3.66 in^2)
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	0
Maximum Power (watts):	110.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 2.7 (6.0 lb)

Volume (cc): 1.7×10^4 (0.6 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum ($^\circ$K):	344 (160° F)
Minimum ($^\circ$K):	219 (-65° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	1	
Failure Parameters		
Failure Rate or Mean (x $10^{\pm 9}$ hr):	70	
Standard Deviation (x 10^{+9} hr):		
Dormancy Factor (N.D.):	1.0	
Total Redundant Elements (No.):	1	

Cost

Design Engineering ($1000):	0	CER
Test and Evaluation ($1000):	0	
Unit Production ($1000):	0	
Reference Quantity (No.):	1	
Factor (N.D.):	1	

Schedule

Development Lead Time Constant (months):	0
Development Lead Time Variable (months):	0
Qualification Lead Time Constant (months):	0
Qualification Lead Time Variable (months):	0
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0301)

Configurations: Cold Gas

Equipment Type: Filter (APM AC-A370-6)

Performance

Technical Characteristics

(1)	Maximum pressure:	2.758×10^7 N/m^2 (4000 psia)
(2)	Flow resistance:	1.0×10^{11} N/(kg-m)^2 (3.0×10^6 psi sec^2/lb^2)
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 0.41 (0.91 lb)

Volume (cc): 2.8×10^3 (0.1 ft^3)

Vibration

Random (g, rms):	18.5
Non-Random (g):	

Temperature

Maximum ($^\circ$K):	344 (160° F)
Minimum ($^\circ$K):	219 (-65° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	1	
Failure Parameters		
Failure Rate or Mean (x $10^{\pm 9}$ hr):	10	
Standard Deviation (x 10^{+9} hr):		
Dormancy Factor (N.D.):	1.0	
Total Redundant Elements (No.):	1	

Cost

Design Engineering ($1000):	0	CER
Test and Evaluation ($1000):	0	
Unit Production ($1000):	0	
Reference Quantity (No.):	1	
Factor (N.D.):	1	

Schedule

Development Lead Time Constant (months):	0
Development Lead Time Variable (months):	0
Qualification Lead Time Constant (months):	0
Qualification Lead Time Variable (months):	0
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0302)

Configurations: Cold Gas

Equipment Type: Filter (Vacco FID10178)

Performance

Technical Characteristics

(1)	Maximum pressure:	2.758×10^7 N/m^2 (4000 psia)
(2)	Flow resistance:	3.4×10^8 N/(kg-m)^2 (1.0×10^4 psi sec^2/lb^2)
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 0.43 (0.95 lb)

Volume (cc): 2.8×10^3 (0.1 ft^3)

Vibration

Random (g, rms):	21.0
Non-Random (g):	

Temperature

Maximum ($^\circ$K):	366 (200° F)
Minimum ($^\circ$K):	219 (-65° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	10
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	1

Cost

Design Engineering ($1000):	0	CER
Test and Evaluation ($1000):	0	
Unit Production ($1000):	0	
Reference Quantity (No.):	1	
Factor (N.D.):	1	

Schedule

Development Lead Time Constant (months):	0
Development Lead Time Variable (months):	0
Qualification Lead Time Constant (months):	0
Qualification Lead Time Variable (months):	0
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0401)

Configurations: Cold Gas

Equipment Type: Pressure Regulator (Sterer 51320)

Performance

Technical Characteristics

(1)	Maximum pressure:	3.448×10^7 N/m^2 (5000 psia)
(2)	Flow area:	0.0090 cm^2 (0.0014 in^2)
(3)	Minimum set point:	1.0×10^5 N/m^2 (15 psia)
(4)	Maximum set point:	6.90×10^5 N/m^2 (100 psia)
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 0.522 (1.15 lb)

Volume (cc): 2.8×10^3 (0.1 ft^3)

Vibration

Random (g, rms):	7.3
Non-Random (g):	

Temperature

Maximum ($^\circ$K):	344 (160° F)
Minimum ($^\circ$K):	233 (-40° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	1
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean (x $10^{\pm 9}$ hr):	5000
Standard Deviation (x 10^{+9} hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	2

Cost

Design Engineering ($1000):	178.0
Test and Evaluation ($1000):	48.0
Unit Production ($1000):	22.5
Reference Quantity (No.):	1
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	2.8
Development Lead Time Variable (months):	1.0
Qualification Lead Time Constant (months):	1.3
Qualification Lead Time Variable (months):	0.1
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0402)

Configurations: Cold Gas

Equipment Type: Pressure Regulator (Fairchild 617000)

Performance

Technical Characteristics

(1)	Maximum pressure:	2.690×10^7 N/m^2 (3900 psia)
(2)	Flow area:	0.006 cm^2 (0.001 in^2)
(3)	Minimum set point:	2.4×10^5 N/m^2 (35 psia)
(4)	Maximum set point:	2.8×10^5 N/m^2 (41 psia)
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 0.54 (1.2 lb)

Volume (cc): 2.8×10^3 (0.1 ft^3)

Vibration

Random (g, rms):	12.7
Non-Random (g):	

Temperature

Maximum ($^\circ$K):	339 (150° F)
Minimum ($^\circ$K):	239 (-30° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	1
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	5000
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	2

Cost

Design Engineering ($1000):	181.0
Test and Evaluation ($1000):	50.0
Unit Production ($1000):	23.0
Reference Quantity (No.):	1
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	2.8
Development Lead Time Variable (months):	1.0
Qualification Lead Time Constant (months):	1.3
Qualification Lead Time Variable (months):	0.1
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0403)

Configurations: Cold Gas

Equipment Type: Pressure Regulator (Sterer 51310)

Performance

Technical Characteristics

(1)	Maximum pressure:	3.172×10^7 N/m^2 (4600 psia)
(2)	Flow area:	0.13 cm^2 (0.02 in^2)
(3)	Minimum set point:	1.38×10^6 N/m^2 (200 psia)
(4)	Maximum set point:	1.72×10^6 N/m^2 (250 psia)
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 1.9 (4.1 lb)

Volume (cc): 1.1×10^4 (0.4 ft^3)

Vibration

Random (g, rms):	7.3
Non-Random (g):	

Temperature

Maximum ($^\circ$K):	344 (160° F)
Minimum ($^\circ$K):	233 (-40° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	1
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean (x $10^{\pm 9}$ hr):	5000
Standard Deviation (x 10^{+9} hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	2

Cost

Design Engineering ($1000):	460.0
Test and Evaluation ($1000):	125.0
Unit Production ($1000):	47.0
Reference Quantity (No.):	1
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	2.8
Development Lead Time Variable (months):	1.5
Qualification Lead Time Constant (months):	1.3
Qualification Lead Time Variable (months):	0.2
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0501)

Configurations: Cold Gas

Equipment Type: Tank (PSI 80082)

Performance

Technical Characteristics

(1)	Volume:	6.55×10^3 cm^3 (400 in^3)
(2)	Maximum pressure:	2.496×10^7 N/m^2 (3620 psia)
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 2.8 (6.1 lb)

Volume (cc): 6.5×10^3 (0.23 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum ($^\circ$K):	344 (160° F)
Minimum ($^\circ$K):	219 (-65° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.): 2

Digital Points (No.):

Sample Rate (sec^{-1}): 1

Word Length (bits): 8

Safety

Failure Model (flag): 1

Failure Parameters

Failure Rate or Mean ($\times 10^{\pm 9}$ hr): 360

Standard Deviation ($\times 10^{+9}$ hr):

Dormancy Factor (N.D.): 1.0

Total Redundant Elements (No.): 4

Cost

Design Engineering ($1000): 0

Test and Evaluation ($1000): 0

Unit Production ($1000): 0

Reference Quantity (No.): 1

Factor (N.D.): 1

} CER

Schedule

Development Lead Time Constant (months): 0

Development Lead Time Variable (months): 0

Qualification Lead Time Constant (months): 0

Qualification Lead Time Variable (months): 0

State-of-Art Factor (N.D.): 1.0

Subsystem: APS (0502)

Configurations: Cold Gas

Equipment Type: Tank (Fansteel 9490304)

Performance

Technical Characteristics

(1)	Volume:	1.57×10^4 cm^3 (960 in^3)
(2)	Maximum pressure:	2.240×10^7 N/m^2 (3250 psia)
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 5.4 (12.0 lb)

Volume (cc): 1.6×10^4 (0.56 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum ($^\circ$K):	344 (160° F)
Minimum ($^\circ$K):	219 (-65° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	360
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	0	CER
Test and Evaluation ($1000):	0	
Unit Production ($1000):	0	
Reference Quantity (No.):	1	
Factor (N.D.):	1	

Schedule

Development Lead Time Constant (months):	0
Development Lead Time Variable (months):	0
Qualification Lead Time Constant (months):	0
Qualification Lead Time Variable (months):	0
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0503)

Configurations: Cold Gas

Equipment Type: Tank (Fansteel)

Performance

Technical Characteristics

(1)	Volume:	2.130×10^4 cm^3 (1300 in^3)
(2)	Maximum pressure:	3.568×10^7 N/m^2 (5175 psia)
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 12.6 (27.8 lb)

Volume (cc): 2.1×10^4 (0.75 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum ($^\circ$K):	344 (160° F)
Minimum ($^\circ$K):	219 (-65° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean (x $10^{\pm 9}$ hr):	360
Standard Deviation (x 10^{+9} hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	0	
Test and Evaluation ($1000):	0	
Unit Production ($1000):	0	CER
Reference Quantity (No.):	1	
Factor (N.D.):	1	

Schedule

Development Lead Time Constant (months):	0
Development Lead Time Variable (months):	0
Qualification Lead Time Constant (months):	0
Qualification Lead Time Variable (months):	0
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0504)

Configurations: Cold Gas

Equipment Type: Tank (Arde E3749)

Performance

Technical Characteristics

(1)	Volume:	3.212×10^4 cm^3 (1960 in^3)
(2)	Maximum pressure:	2.240×10^7 N/m^2 (3250 psia)
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg):	10.0 (22.0 lb)
Volume (cc):	3.2×10^4 (1.13 ft^3)

Vibration

Random (g, rms):	8.3
Non-Random (g):	

Temperature

Maximum ($^\circ$K):	344 (160° F)
Minimum ($^\circ$K):	219 (-65° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean (x $10^{\pm 9}$ hr):	360
Standard Deviation (x 10^{+9} hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	0	CER
Test and Evaluation ($1000):	0	
Unit Production ($1000):	0	
Reference Quantity (No.):	1	
Factor (N.D.):	1	

Schedule

Development Lead Time Constant (months):	0
Development Lead Time Variable (months):	0
Qualification Lead Time Constant (months):	0
Qualification Lead Time Variable (months):	0
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0505)

Configurations: Cold Gas

Equipment Type: Tank (Airite 6396)

Performance

Technical Characteristics

(1)	Volume:	4.441×10^4 cm^3 (2710 in^3)
(2)	Maximum pressure:	2.240×10^7 N/m^2 (3250 psia)
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg):	13.6 (30.0 lb)
Volume (cc):	4.4×10^4 (1.57 ft^3)

Vibration

Random (g, rms):	
Non-Random (g):	

Temperature

Maximum ($^\circ$K):	344 (160°F)
Minimum ($^\circ$K):	219 (-65°F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.): 2

Digital Points (No.):

Sample Rate (sec^{-1}): 1

Word Length (bits): 8

Safety

Failure Model (flag): 1

Failure Parameters

Failure Rate or Mean (x $10^{\pm 9}$ hr): 360

Standard Deviation (x 10^{+9} hr):

Dormancy Factor (N.D.): 1.0

Total Redundant Elements (No.): 4

Cost

Design Engineering ($1000): 0

Test and Evaluation ($1000): 0

Unit Production ($1000): 0

Reference Quantity (No.): 1

Factor (N.D.): 1

CER

Schedule

Development Lead Time Constant (months): 0

Development Lead Time Variable (months): 0

Qualification Lead Time Constant (months): 0

Qualification Lead Time Variable (months): 0

State-of-Art Factor (N.D.): 1.0

Subsystem: APS (0506)

Configurations: Cold Gas

Equipment Type: Tank (Airite 6485-3)

Performance

Technical Characteristics

(1)	Volume:	5.709×10^4 cm^3 (3484 in^3)
(2)	Maximum pressure:	3.310×10^7 N/m^2 (4800 psia)
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 22.7 (50.0 lb)

Volume (cc): 2.72×10^4 (2.02 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum ($^\circ$K):	366 (200° F)
Minimum ($^\circ$K):	200 (-100° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.): 2

Digital Points (No.):

Sample Rate (sec^{-1}): 1

Word Length (bits): 8

Safety

Failure Model (flag): 1

Failure Parameters

Failure Rate or Mean ($\times 10^{\pm 9}$ hr): 360

Standard Deviation ($\times 10^{+9}$ hr):

Dormancy Factor (N.D.): 1.0

Total Redundant Elements (No.): 4

Cost

Design Engineering ($1000): 0

Test and Evaluation ($1000): 0

Unit Production ($1000): 0

Reference Quantity (No.): 1

Factor (N.D.): 1

} CER

Schedule

Development Lead Time Constant (months): 0

Development Lead Time Variable (months): 0

Qualification Lead Time Constant (months): 0

Qualification Lead Time Variable (months): 0

State-of-Art Factor (N.D.): 1.0

Subsystem: APS (0507)

Configurations: Cold Gas

Equipment Type: Tank (Airite 6529-1)

Performance

Technical Characteristics

(1)	Volume:	9.504×10^4 cm^3 (5800 in^3)
(2)	Maximum pressure:	2.413×10^7 N/m^2 (3500 psia)
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 25.1 (55.5 lb)

Volume (cc): 9.51×10^4 (3.36 ft^3)

Vibration

Random (g, rms):	13.1
Non-Random (g):	

Temperature

Maximum ($^\circ$K):	394 (160° F)
Minimum ($^\circ$K):	219 (-65° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	360
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	0	CER
Test and Evaluation ($1000):	0	
Unit Production ($1000):	0	
Reference Quantity (No.):	1	
Factor (N.D.):	1	

Schedule

Development Lead Time Constant (months):	0
Development Lead Time Variable (months):	0
Qualification Lead Time Constant (months):	0
Qualification Lead Time Variable (months):	0
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0508)

Configurations: Cold Gas

Equipment Type: Tank (Fansteel 4425003)

Performance

Technical Characteristics

(1)	Volume:	1.274×10^5 cm^3 (7775 in^3)
(2)	Maximum pressure:	2.206×10^7 N/m^2 (3200 psia)
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 49.9 (110.0 lb)

Volume (cc): 1.27×10^5 (4.50 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum ($^\circ$K):	344 (160° F)
Minimum ($^\circ$K):	219 (-65° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean (x $10^{\pm 9}$ hr):	360
Standard Deviation (x 10^{+9} hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	0	CER
Test and Evaluation ($1000):	0	
Unit Production ($1000):	0	
Reference Quantity (No.):	1	
Factor (N.D.):	1	

Schedule

Development Lead Time Constant (months):	0
Development Lead Time Variable (months):	0
Qualification Lead Time Constant (months):	0
Qualification Lead Time Variable (months):	0
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0601)

Configurations: Cold Gas

Equipment Type: Fill and Drain Valve (Sterer 34650-1)

Performance

Technical Characteristics

(1) Maximum pressure: 3.172×10^7 N/m^2 (4600 psia)

(2)

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts): NA

Maximum Power (watts): NA

Minimum Power (watts): NA

Nominal Voltage (volts): NA

Maximum Voltage (volts): NA

Minimum Voltage (volts): NA

Converter/Inverter Requirement (flag):

Weight (kg): 0.073 (0.16 lb)

Volume (cc): 560 (0.02 ft^3)

Vibration

Random (g, rms): 7.3

Non-Random (g):

Temperature

Maximum (^{o}K): 344 (160^o F)

Minimum (^{o}K): 233 (-40^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean (x $10^{\pm 9}$ hr):	70
Standard Deviation (x 10^{+9} hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	1

Cost

Design Engineering ($1000):	0
Test and Evaluation ($1000):	0
Unit Production ($1000):	0
Reference Quantity (No.):	1
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	0
Development Lead Time Variable (months):	0
Qualification Lead Time Constant (months):	0
Qualification Lead Time Variable (months):	0
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0701)

Configurations: Cold Gas

Equipment Type: Relief Valve (Pyronetics)

Performance

Technical Characteristics

(1)	Minimum set point:	1.86×10^6 N/m^2 (270 psia)
(2)	Maximum set point:	2.07×10^6 N/m^2 (300 psia)
(3)	Maximum operating pressure:	2.413×10^7 N/m^2 (3500 psia)
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 0.09 (0.2 lb)

Volume (cc): 560 (0.02 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^{o}K):	333 (140^o F)
Minimum (^{o}K):	233 (-40^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean (x $10^{\pm 9}$ hr):	70
Standard Deviation (x 10^{+9} hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	1

Cost

Design Engineering ($1000):	0
Test and Evaluation ($1000):	0
Unit Production ($1000):	0
Reference Quantity (No.):	1
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	0
Development Lead Time Variable (months):	0
Qualification Lead Time Constant (months):	0
Qualification Lead Time Variable (months):	0
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0801)

Configurations: Monopropellant

Equipment Type: Thruster (Rocket Research MR-74)

Performance

Technical Characteristics

(1)	Thrust level:	0.44 N (0.1 lb)
(2)	Pulse life:	100,000 cycles
(3)	Inlet pressure:	2.07×10^6 N/m^2 (300 psia)
(4)	Total impulse:*	8.0×10^4 N-sec (18,000 lb-sec)
(5)	ISP:*	220 sec
(6)	Mixture ratio (N.D.):**	
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	1.0
Maximum Power (watts):	2.6
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg):	0.29 (0.65 lb)
Volume (cc):	2.0×10^3 (0.07 ft^3)

Vibration

Random (g, rms):	17.0
Non-Random (g):	

Temperature

Maximum ($^\circ$K):	355 (180° F)
Minimum ($^\circ$K):	278 (40° F)

Pressure (kg/m^2):

*Applicable to monopropellant and bipropellant thrusters
**Applicable to bipropellant thrusters only

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.): 2

Digital Points (No.):

Sample Rate (sec^{-1}): 1

Word Length (bits): 8

Safety

Failure Model (flag): 5

Failure Parameters

Failure Rate or Mean ($\times 10^{\pm 9}$ hr): 1700

Standard Deviation ($\times 10^{+9}$ hr):

Dormancy Factor (N.D.): 0.1

Total Redundant Elements (No.): 12

Cost

Design Engineering ($1000): 109.0

Test and Evaluation ($1000): 27.0

Unit Production ($1000): 8.2

Reference Quantity (No.): 3

Factor (N.D.): 1

Schedule

Development Lead Time Constant (months): 3.0

Development Lead Time Variable (months): 0.8

Qualification Lead Time Constant (months): 1.5

Qualification Lead Time Variable (months): 0.1

State-of-Art Factor (N.D.): 1.0

Subsystem: APS (0802)

Configurations: Monopropellant

Equipment Type: Thruster (Hamilton Standard REA-10-13)

Performance

Technical Characteristics

(1)	Thrust level:	0.44 N (0.1 lb)
(2)	Pulse life:	375,000 cycles
(3)	Inlet pressure:	1.72×10^6 N/m^2 (250 psia)
(4)	Total impulse:*	7.43×10^4 N-sec (16,700 lb-sec)
(5)	ISP:*	225 sec
(6)	Mixture ratio (N.D.):**	
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	1.0
Maximum Power (watts):	6.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 0.14 (0.3 lb)

Volume (cc): 850 (0.03 ft^3)

Vibration

Random (g, rms):	21.0
Non-Random (g):	

Temperature

Maximum ($^\circ$K):	333 (140° F)
Minimum ($^\circ$K):	266 (20° F)

Pressure (kg/m^2):

*Applicable to monopropellant and bipropellant thrusters
**Applicable to bipropellant thrusters only

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	5
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	1700
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.1
Total Redundant Elements (No.):	12

Cost

Design Engineering ($1000):	61.0
Test and Evaluation ($1000):	15.0
Unit Production ($1000):	4.4
Reference Quantity (No.):	3
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	3.0
Development Lead Time Variable (months):	0.8
Qualification Lead Time Constant (months):	1.5
Qualification Lead Time Variable (months):	0.1
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0803)

Configurations: Monopropellant

Equipment Type: Thruster (Rocket Research MR-6C)

Performance

Technical Characteristics

(1)	Thrust level:	2.2 N (0.5 lb)
(2)	Pulse life:	100,000 cycles
(3)	Inlet pressure:	1.93×10^6 N/m^2 (280 psia)
(4)	Total impulse*:	6.7×10^4 N-sec (15,000 lb-sec)
(5)	ISP*:	224 sec
(6)	Mixture ratio (N.D.)**:	
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	1.0
Maximum Power (watts):	4.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 0.29 (0.65 lb)

Volume (cc): 2.0×10^3 (0.07 ft^3)

Vibration

Random (g, rms):	21.0
Non-Random (g):	

Temperature

Maximum ($^\circ$K):	328 (130° F)
Minimum ($^\circ$K):	244 (-20° F)

Pressure (kg/m^2):

*Applicable to monopropellant and bipropellant thrusters
**Applicable to bipropellant thrusters only

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	5
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	1700
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.1
Total Redundant Elements (No.):	12

Cost

Design Engineering ($1000):	109.0
Test and Evaluation ($1000):	27.0
Unit Production ($1000):	8.2
Reference Quantity (No.):	3
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	3.0
Development Lead Time Variable (months):	0.8
Qualification Lead Time Constant (months):	1.5
Qualification Lead Time Variable (months):	0.1
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0804)

Configurations: Monopropellant

Equipment Type: Thruster (Hamilton Standard REA-17-7)

Performance

Technical Characteristics

(1)	Thrust level:	2.2 N (0.5 lb)
(2)	Pulse life:	1.5×10^6 cycles
(3)	Inlet pressure:	1.72×10^6 N/m^2 (250 psia)
(4)	Total impulse*:	8.0×10^4 N-sec (18,000 lb-sec)
(5)	ISP*:	227 sec
(6)	Mixture ratio (N.D.)**:	
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	1.0
Maximum Power (watts):	8.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 0.2 (0.4 lb)

Volume (cc): 1.1×10^3 (0.04 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum ($^\circ$K):	333 (140° F)
Minimum ($^\circ$K):	266 (20° F)

Pressure (kg/m^2):

*Applicable to monopropellant and bipropellant thrusters
**Applicable to bipropellant thrusters only

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	5
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	1700
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.1
Total Redundant Elements (No.):	12

Cost

Design Engineering ($1000):	76.0
Test and Evaluation ($1000):	76.0
Unit Production ($1000):	5.6
Reference Quantity (No.):	3
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	3.0
Development Lead Time Variable (months):	0.8
Qualification Lead Time Constant (months):	1.5
Qualification Lead Time Variable (months):	0.1
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0805)

Configurations: Monopropellant

Equipment Type: Thruster (Hughes HS-333)

Performance

Technical Characteristics

(1)	Thrust level:	4.4 N (1.0 lb)
(2)	Pulse life:	20,000 cycles
(3)	Inlet pressure (psia):	
(4)	Total impulse (lb-sec)*:	
(5)	ISP (sec)*:	
(6)	Mixture ratio (N.D.)**:	
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):

Maximum Power (watts):

Minimum Power (watts):

Nominal Voltage (volts):

Maximum Voltage (volts):

Minimum Voltage (volts):

Converter/Inverter Requirement (flag):

Weight (kg):

Volume (cc):

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^{o}K):

Minimum (^{o}K):

Pressure (kg/m^2):

*Applicable to monopropellant and bipropellant thrusters
**Applicable to bipropellant thrusters only

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	5
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	1700
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.1
Total Redundant Elements (No.):	12

Cost

Design Engineering ($1000):	115.0
Test and Evaluation ($1000):	115.0
Unit Production ($1000):	8.7
Reference Quantity (No.):	3
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	3.0
Development Lead Time Variable (months):	0.8
Qualification Lead Time Constant (months):	1.5
Qualification Lead Time Variable (months):	0.1
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0806)

Configurations: Monopropellant

Equipment Type: Thruster (TRW MRE-1)

Performance

Technical Characteristics

(1)	Thrust level:	4.4 N (1.0 lb)
(2)	Pulse life:	100,000 cycles
(3)	Inlet pressure:	2.59×10^6 N/m^2 (375 psia)
(4)	Total impulse*:	4.4×10^4 N-sec (9,800 lb-sec)
(5)	ISP*:	220 sec
(6)	Mixture ratio (N.D.)**:	
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	1.0
Maximum Power (watts):	5.4
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	31.0
Minimum Voltage (volts):	26.0
Converter/Inverter Requirement (flag):	

Weight (kg): 0.3 (0.7 lb)

Volume (cc): 2.0×10^3 (0.07 ft^3)

Vibration

Random (g, rms):	21.0
Non-Random (g):	

Temperature

Maximum ($^\circ$K):	322 (120° F)
Minimum ($^\circ$K):	278 (40° F)

Pressure (kg/m^2):

*Applicable to monopropellant and bipropellant thrusters
**Applicable to bipropellant thrusters only

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	5
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	1700
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.1
Total Redundant Elements (No.):	12

Cost

Design Engineering ($1000):	115.0
Test and Evaluation ($1000):	115.0
Unit Production ($1000):	8.7
Reference Quantity (No.):	3
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	3.0
Development Lead Time Variable (months):	0.9
Qualification Lead Time Constant (months):	1.5
Qualification Lead Time Variable (months):	0.1
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0807)

Configurations: Monopropellant

Equipment Type: Thruster (TRW MRE-3)

Performance

Technical Characteristics

(1)	Thrust level:	16 N (3.7 lb)
(2)	Pulse life:	60,000 cycles
(3)	Inlet pressure:	4.14×10^6 N/m^2 (600 psia)
(4)	Total impulse (lb-sec)*:	
(5)	ISP (sec)*:	
(6)	Mixture ratio (N.D.)**:	
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	1.0
Maximum Power (watts):	5.4
Minimum Power (watts):	0.0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	31.0
Minimum Voltage (volts):	26.0
Converter/Inverter Requirement (flag):	

Weight (kg): 0.3 (0.6 lb)

Volume (cc): 1.7×10^3 (0.06 ft^3)

Vibration

Random (g, rms):	19.5
Non-Random (g):	

Temperature

Maximum (^{o}K):	322 (120^o F)
Minimum (^{o}K):	278 (40^o F)

Pressure (kg/m^2):

*Applicable to monopropellant and bipropellant thrusters
**Applicable to bipropellant thrusters only

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	5
Failure Parameters	
Failure Rate or Mean (x $10^{\pm 9}$ hr):	1700
Standard Deviation (x 10^{+9} hr):	
Dormancy Factor (N.D.):	0.1
Total Redundant Elements (No.):	12

Cost

Design Engineering ($1000):	101.0
Test and Evaluation ($1000):	101.0
Unit Production ($1000):	7.7
Reference Quantity (No.):	3
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	3.0
Development Lead Time Variable (months):	0.8
Qualification Lead Time Constant (months):	1.5
Qualification Lead Time Variable (months):	0.1
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0808)

Configurations: Monopropellant

Equipment Type: Thruster (TRW 404620)

Performance

Technical Characteristics

(1)	Thrust level:	18 N (4.1 lb)
(2)	Pulse life:	93,000 cycles
(3)	Inlet pressure:	4.14×10^6 N/m^2 (600 psia)
(4)	Total impulse*:	6.49×10^4 N-sec (14,600 lb-sec)
(5)	ISP*:	230 sec
(6)	Mixture ratio (N.D.)**:	
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	1.0
Maximum Power (watts):	5.53
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.6
Minimum Voltage (volts):	26.0
Converter/Inverter Requirement (flag):	

Weight (kg): 0.3 (0.6 lb)

Volume (cc): 1.7×10^3 (0.06 ft^3)

Vibration

Random (g, rms):	19.5
Non-Random (g):	

Temperature

Maximum ($^\circ$K):	322 (120° F)
Minimum ($^\circ$K):	278 (40° F)

Pressure (kg/m^2):

*Applicable to monopropellant and bipropellant thrusters
**Applicable to bipropellant thrusters only

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	5
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	1700
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.1
Total Redundant Elements (No.):	12

Cost

Design Engineering ($1000):	101.0
Test and Evaluation ($1000):	101.0
Unit Production ($1000):	7.7
Reference Quantity (No.):	3
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	3.0
Development Lead Time Variable (months):	1.0
Qualification Lead Time Constant (months):	1.5
Qualification Lead Time Variable (months):	0.1
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0809)

Configurations: Monopropellant

Equipment Type: Thruster (Hamilton Standard REA-16-10)

Performance

Technical Characteristics

(1)	Thrust level:	22 N (5.0 lb)
(2)	Pulse life:	100,000 cycles
(3)	Inlet pressure:	2.07×10^6 N/m^2 (300 psia)
(4)	Total impulse*:	1.49×10^5 N-sec (33,500 lb-sec)
(5)	ISP*:	235 sec
(6)	Mixture ratio (N.D.)**:	
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	1.0
Maximum Power (watts):	17.8
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 0.4 (0.9 lb)

Volume (cc): 2.5×10^3 (0.09 ft^3)

Vibration

Random (g, rms):	19.6
Non-Random (g):	

Temperature

Maximum ($^\circ$K):	333 (140° F)
Minimum ($^\circ$K):	278 (40° F)

Pressure (kg/m^2):

*Applicable to monopropellant and bipropellant thrusters
**Applicable to bipropellant thrusters only

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	5
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	1700
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.1
Total Redundant Elements (No.):	12

Cost

Design Engineering ($1000):	139.0
Test and Evaluation ($1000):	139.0
Unit Production ($1000):	10.6
Reference Quantity (No.):	3
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	3.0
Development Lead Time Variable (months):	1.2
Qualification Lead Time Constant (months):	1.5
Qualification Lead Time Variable (months):	0.1
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0810)

Configurations: Monopropellant

Equipment Type: Thruster (Rocket Research MR-50A)

Performance

Technical Characteristics

(1)	Thrust level:	22 N (5.0 lb)
(2)	Pulse life:	175,000 cycles
(3)	Inlet pressure:	1.59×10^6 N/m^2 (230 psia)
(4)	Total impulse*:	2.02×10^5 N-sec (45,500 lb-sec)
(5)	ISP*:	227 sec
(6)	Mixture ratio (N.D.)**:	
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	1.0
Maximum Power (watts):	21.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 0.54 (1.2 lb)

Volume (cc): 2.8×10^3 (0.1 ft^3)

Vibration

Random (g, rms): 38.0

Non-Random (g):

Temperature

Maximum (^{o}K): 333 (140^o F)

Minimum (^{o}K): 278 (40^o F)

Pressure (kg/m^2):

*Applicable to monopropellant and bipropellant thrusters.
**Applicable to bipropellant thrusters only

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	5
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	1700
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.1
Total Redundant Elements (No.):	12

Cost

Design Engineering ($1000):	171.0
Test and Evaluation ($1000):	171.0
Unit Production ($1000):	13.2
Reference Quantity (No.):	3
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	3.0
Development Lead Time Variable (months):	1.0
Qualification Lead Time Constant (months):	1.5
Qualification Lead Time Variable (months):	0.1
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0811)

Configurations: Monopropellant

Equipment Type: Thruster (Rocket Research MR-3A)

Performance

Technical Characteristics

(1)	Thrust level:	110 N (25.0 lb)
(2)	Pulse life:	25,000 cycles
(3)	Inlet pressure:	2.48×10^6 N/m^2 (360 psia)
(4)	Total impulse*:	6.27×10^5 N-sec (141,000 lb-sec)
(5)	ISP*:	228 sec
(6)	Mixture ratio (N.D.)**:	
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	1.0
Maximum Power (watts):	26.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 2.10 (4.64 lb)

Volume (cc): 1.3×10^4 (0.46 ft^3)

Vibration

Random (g, rms):	36.0
Non-Random (g):	

Temperature

Maximum ($^\circ$K):	394 (250° F)
Minimum ($^\circ$K):	278 (40° F)

Pressure (kg/m^2):

*Applicable to monopropellant and bipropellant thrusters
**Applicable to bipropellant thrusters only

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	5
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	1.700
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.1
Total Redundant Elements (No.):	6

Cost

Design Engineering ($1000):	480.0
Test and Evaluation ($1000):	480.0
Unit Production ($1000):	39.0
Reference Quantity (No.):	3
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	3.0
Development Lead Time Variable (months):	1.5
Qualification Lead Time Constant (months):	1.5
Qualification Lead Time Variable (months):	0.2
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0812)

Configurations: Monopropellant

Equipment Type: Thruster (Marquardt R-24-C)

Performance

Technical Characteristics

(1)	Thrust level:	110 N (25.0 lb)
(2)	Pulse life:	200,000 cycles
(3)	Inlet pressure:	2.28×10^6 N/m^2 (330 psia)
(4)	Total impulse*:	2.22×10^5 N-sec (50,000 lb-sec)
(5)	ISP*:	231 sec
(6)	Mixture ratio (N.D.)**:	
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	1.0
Maximum Power (watts):	56.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 1.1 (2.5 lb)

Volume (cc): 7.1×10^3 (0.25 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum ($^\circ$K):	322 (120° F)
Minimum ($^\circ$K):	278 (40° F)

Pressure (kg/m^2):

*Applicable to monopropellant and bipropellant thrusters
**Applicable to bipropellant thrusters only

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	5
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	1700
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.1
Total Redundant Elements (No.):	6

Cost

Design Engineering ($1000):	300.0
Test and Evaluation ($1000):	300.0
Unit Production ($1000):	23.8
Reference Quantity (No.):	3
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	3.0
Development Lead Time Variable (months):	1.5
Qualification Lead Time Constant (months):	1.5
Qualification Lead Time Variable (months):	0.2
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0813)

Configurations: Monopropellant

Equipment Type: Thruster (Rocket Research MR-3C)

Performance

Technical Characteristics

(1)	Thrust level:	180 N (40.0 lb)
(2)	Pulse life:	25,000 cycles
(3)	Inlet pressure:	3.55×10^6 N/m^2 (515 psia)
(4)	Total impulse*:	6.27×10^5 N-sec (141,000 lb-sec)
(5)	ISP*:	228 sec
(6)	Mixture ratio (N.D.)**:	
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	1.0
Maximum Power (watts):	28.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 1.26 (2.78 lb)

Volume (cc): 7.9×10^3 (0.28 ft^3)

Vibration

Random (g, rms):	36.0
Non-Random (g):	

Temperature

Maximum ($^\circ$K):	394 (250° F)
Minimum ($^\circ$K):	278 (40° F)

Pressure (kg/m^2):

*Applicable to monopropellant and bipropellant thrusters
**Applicable to bipropellant thrusters only

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	5
Failure Parameters	
Failure Rate or Mean ($\bar{x}$ $10^{\pm 9}$ hr):	1700
Standard Deviation ($x \cdot 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.1
Total Redundant Elements (No.):	6

Cost

Design Engineering ($1000):	322.0
Test and Evaluation ($1000):	322.0
Unit Production ($1000):	25.8
Reference Quantity (No.):	3
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	3.0
Development Lead Time Variable (months):	1.7
Qualification Lead Time Constant (months):	1.5
Qualification Lead Time Variable (months):	0.3
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0814)

Configurations: Monopropellant

Equipment Type: Thruster (TRW MRE-50-73)

Performance

Technical Characteristics

(1)	Thrust level:	222 N (50.0 lb)
(2)	Pulse life:	1500 cycles
(3)	Inlet pressure (psia):	
(4)	Total impulse*:	2.22×10^4 N-sec (5000 lb-sec)
(5)	ISP*:	230 sec
(6)	Mixture ratio (N.D.)**:	
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	1.0
Maximum Power (watts):	20.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 2.3 (5.0 lb)

Volume (cc): 1.4×10^4 (0.5 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	333 (140° F)
Minimum (^oK):	278 (40° F)

Pressure (kg/m^2):

*Applicable to monopropellant and bipropellant thrusters
**Applicable to bipropellant thrusters only

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	5
Failure Parameters	
Failure Rate or Mean (x $10^{\pm 9}$ hr):	1700
Standard Deviation (x 10^{+9} hr):	
Dormancy Factor (N.D.):	0.1
Total Redundant Elements (No.):	6

Cost

Design Engineering ($1000):	502.0
Test and Evaluation ($1000):	502.0
Unit Production ($1000):	41.0
Reference Quantity (No.):	3
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	3.0
Development Lead Time Variable (months):	1.9
Qualification Lead Time Constant (months):	1.5
Qualification Lead Time Variable (months):	0.3
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0815)

Configurations: Monopropellant

Equipment Type: Thruster (Marquardt R-30)

Performance

Technical Characteristics

(1)	Thrust level:	689 N (155.0 lb)
(2)	Pulse life:	500 cycles
(3)	Inlet pressure:	3.10×10^6 N/m^2 (450 psia)
(4)	Total impulse*:	2.22×10^5 N-sec (50,000 lb-sec)
(5)	ISP*:	234 sec
(6)	Mixture ratio (N.D.)**:	
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	1.0
Maximum Power (watts):	29.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 1.3 (2.9 lb)

Volume (cc): 8.2×10^3 (0.29 ft^3)

Vibration

Random (g, rms):	15.0
Non-Random (g):	

Temperature

Maximum ($^\circ$K):	322 (120° F)
Minimum ($^\circ$K):	278 (40° F)

Pressure (kg/m^2):

*Applicable to monopropellant and bipropellant thrusters
**Applicable to bipropellant thrusters only

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	5
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	1700
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.1
Total Redundant Elements (No.):	6

Cost

Design Engineering ($1000):	334.0
Test and Evaluation ($1000):	334.0
Unit Production ($1000):	26.8
Reference Quantity (No.):	3
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	3.0
Development Lead Time Variable (months):	3.0
Qualification Lead Time Constant (months):	1.5
Qualification Lead Time Variable (months):	0.6
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0816)

Configurations: Monopropellant

Equipment Type: Thruster (Walter Kidde 142692)

Performance

Technical Characteristics

(1)	Thrust level:	1330 N (300.0 lb)
(2)	Pulse life (cycles):	
(3)	Inlet pressure (psia):	
(4)	Total impulse*:	2.22×10^6 N-sec (500,000 lb-sec)
(5)	ISP (sec)*:	
(6)	Mixture ratio (N.D.)**:	
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	1.0
Maximum Power (watts):	20.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 2.3 (5.0 lb)

Volume (cc): 1.4×10^4 (0.5 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	333 (140° F)
Minimum (^oK):	278 (40° F)

Pressure (kg/m^2):

*Applicable to monopropellant and bipropellant thrusters
**Applicable to bipropellant thrusters only

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	5
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	1700
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.1
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	502.0
Test and Evaluation ($1000):	502.0
Unit Production ($1000):	41.0
Reference Quantity (No.):	3
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	3.0
Development Lead Time Variable (months):	3.7
Qualification Lead Time Constant (months):	1.5
Qualification Lead Time Variable (months):	0.6
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0817)

Configurations: Monopropellant

Equipment Type: Thruster (Rocket Research MR-80A)

Performance

Technical Characteristics

(1)	Thrust level:	2810 N (632.0 lb)
(2)	Pulse life:	500 cycles
(3)	Inlet pressure:	3.31×10^6 N/m^2 (480 psia)
(4)	Total impulse*:	2.30×10^5 N-sec (51,600 lb-sec)
(5)	ISP*:	227 sec
(6)	Mixture ratio (N.D.)**:	
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	1.0
Maximum Power (watts):	18.5
Minimum Power (watts):	0
Nominal Voltage (volts):	37.0
Maximum Voltage (volts):	
Minimum Voltage (volts):	
Converter/Inverter Requirement (flag):	

Weight (kg):	7.67 (16.9 lb)
Volume (cc):	4.8×10^4 (1.7 ft^3)

Vibration

Random (g, rms):	5.5
Non-Random (g):	

Temperature

Maximum ($^\circ$K):	325 (125° F)
Minimum ($^\circ$K):	278 (40° F)

Pressure (kg/m^2):

*Applicable to monopropellant and bipropellant thrusters
**Applicable to bipropellant thrusters only

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	5
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	1700
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.1
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	1250.0
Test and Evaluation ($1000):	1250.0
Unit Production ($1000):	105.0
Reference Quantity (No.):	3
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	3.0
Development Lead Time Variable (months):	5.1
Qualification Lead Time Constant (months):	1.5
Qualification Lead Time Variable (months):	1.3
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0901)

Configurations: Monopropellant

Equipment Type: Isolation Valve (latching solenoid) (Hydraulic Research 258278)

Performance

Technical Characteristics

(1)	Maximum pressure:	2.41×10^6 N/m^2 (350 psia)
(2)	Flow area:	0.01 cm^2 (0.0017 in.^{2})
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	0
Maximum Power (watts):	88.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	33.0
Minimum Voltage (volts):	23.0
Converter/Inverter Requirement (flag):	

Weight (kg): 0.3 (0.7 lb)

Volume (cc): 2.0×10^3 (0.07 ft^3)

Vibration

Random (g, rms):	21.5
Non-Random (g):	

Temperature

Maximum ($^\circ$K):	333 (140° F)
Minimum ($^\circ$K):	278 (40° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	1	
Failure Parameters		
Failure Rate or Mean (x $10^{\pm 9}$ hr):	200	
Standard Deviation (x 10^{+9} hr):		
Dormancy Factor (N.D.):	1.0	
Total Redundant Elements (No.):	7	

Cost

Design Engineering ($1000):	0	CER
Test and Evaluation ($1000):	0	CER
Unit Production ($1000):	0	CER
Reference Quantity (No.):	1	CER
Factor (N.D.):	1	CER

Schedule

Development Lead Time Constant (months):	0
Development Lead Time Variable (months):	0
Qualification Lead Time Constant (months):	0
Qualification Lead Time Variable (months):	0
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0902)

Configurations: Monopropellant

Equipment Type: Isolation Valve (latching solenoid) (Marquardt 22700)

Performance

Technical Characteristics

(1) Maximum pressure: 2.48×10^6 N/m^2 (360 psia)

(2) Flow area: 0.77 cm^2 (0.12 in.^{2})

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts): 0

Maximum Power (watts): 60.0

Minimum Power (watts): 0

Nominal Voltage (volts): 27.0

Maximum Voltage (volts): 30.0

Minimum Voltage (volts): 24.0

Converter/Inverter Requirement (flag):

Weight (kg): 0.59 (1.3 lb)

Volume (cc): 3.7×10^3 (0.13 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum ($^\circ$K): 322 (120° F)

Minimum ($^\circ$K): 278 (40° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	1	
Failure Parameters		
Failure Rate or Mean (x $10^{\pm 9}$ hr):	200	
Standard Deviation (x 10^{+9} hr):		
Dormancy Factor (N.D.):	1.0	
Total Redundant Elements (No.):	7	

Cost

Design Engineering ($1000):	0	CER
Test and Evaluation ($1000):	0	
Unit Production ($1000):	0	
Reference Quantity (No.):	1	
Factor (N.D.):	1	

Schedule

Development Lead Time Constant (months):	0
Development Lead Time Variable (months):	0
Qualification Lead Time Constant (months):	0
Qualification Lead Time Variable (months):	0
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (0903)

Configurations: Monopropellant

Equipment Type: Isolation Valve (pyrotechnic) (Pyronetics 1349)

Performance

Technical Characteristics

(1) Maximum pressure: 2.758×10^7 N/m^2 (4000 psia)

(2) Flow area: 7.7 cm^2 (1.2 in.^{2})

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts): 1.0

Maximum Power (watts): 140.0

Minimum Power (watts): 0

Nominal Voltage (volts): 28.0

Maximum Voltage (volts): 32.0

Minimum Voltage (volts): 24.0

Converter/Inverter Requirement (flag):

Weight (kg): 0.68 (1.5 lb)

Volume (cc): 4.2×10^3 (0.15 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum ($^\circ$K): 325 (125°F)

Minimum ($^\circ$K): 219 (-65°F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	1	
Failure Parameters		
Failure Rate or Mean (x $10^{\pm 9}$ hr):	100	
Standard Deviation (x 10^{+9} hr):		
Dormancy Factor (N.D.):	1.0	
Total Redundant Elements (No.):	7	

Cost

Design Engineering ($1000):	0	CER
Test and Evaluation ($1000):	0	
Unit Production ($1000):	0	
Reference Quantity (No.):	1	
Factor (N.D.):	1	

Schedule

Development Lead Time Constant (months):	0
Development Lead Time Variable (months):	0
Qualification Lead Time Constant (months):	0
Qualification Lead Time Variable (months):	0
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (1001)

Configurations: Monopropellant

Equipment Type: Filter (Wintec 3181406-100)

Performance

Technical Characteristics

(1)	Maximum pressure:	6.895×10^7 N/m^2 (1000 psia)
(2)	Flow resistance:	1.61×10^8 N/(kg-m)^2 (4.8×10^3 psi sec^2/lb^2)
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 0.2 (0.5 lb)

Volume (cc): 1.4×10^3 (0.05 ft^3)

Vibration

Random (g, rms):	21.5
Non-Random (g):	

Temperature

Maximum ($^\circ$K):	333 (140° F)
Minimum ($^\circ$K):	278 (40° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	1	
Failure Parameters		
Failure Rate or Mean (x $10^{\pm 9}$ hr):	10	
Standard Deviation (x 10^{+9} hr):		
Dormancy Factor (N.D.):	1.0	
Total Redundant Elements (No.):	7	

Cost

Design Engineering ($1000):	0	CER
Test and Evaluation ($1000):	0	
Unit Production ($1000):	0	
Reference Quantity (No.):	1	
Factor (N.D.):	1	

Schedule

Development Lead Time Constant (months):	0
Development Lead Time Variable (months):	0
Qualification Lead Time Constant (months):	0
Qualification Lead Time Variable (months):	0
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (1002)

Configurations: Monopropellant

Equipment Type: Filter (Wintec 15267-592)

Performance

Technical Characteristics

(1) Maximum pressure: 2.76×10^6 N/m^2 (400 psia)

(2) Flow resistance: 1.19×10^7 N/(kg-m)^2 (356 psi sec^2/lb^2)

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts): NA

Maximum Power (watts): NA

Minimum Power (watts): NA

Nominal Voltage (volts): NA

Maximum Voltage (volts): NA

Minimum Voltage (volts): NA

Converter/Inverter Requirement (flag):

Weight (kg): 0.2 (0.5 lb)

Volume (cc): 1.4×10^3 (0.05 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum ($^\circ$K): 333 (140° F)

Minimum ($^\circ$K): 278 (40° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	1	
Failure Parameters		
Failure Rate or Mean (x $10^{\pm 9}$ hr):	10	
Standard Deviation (x 10^{+9} hr):		
Dormancy Factor (N.D.):	1.0	
Total Redundant Elements (No.):	7	

Cost

Design Engineering ($1000):	0	CER
Test and Evaluation ($1000):	0	
Unit Production ($1000):	0	
Reference Quantity (No.):	1	
Factor (N.D.):	1	

Schedule

Development Lead Time Constant (months):	0
Development Lead Time Variable (months):	0
Qualification Lead Time Constant (months):	0
Qualification Lead Time Variable (months):	0
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (1101)

Configurations: Monopropellant

Equipment Type: Tank (Arde HS D3780)

Performance

Technical Characteristics

(1)	Volume:	1.5×10^3 cm^3 (92 in^3)
(2)	Maximum pressure:	3.86×10^6 N/m^2 (560 psia)
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 1.3 (2.8 lb)

Volume (cc): 1.5×10^3 (0.053 ft^3)

Vibration

Random (g, rms):	10.0
Non-Random (g):	

Temperature

Maximum ($^\circ$K):	333 (140° F)
Minimum ($^\circ$K):	278 (40° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	360
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	5

Cost

Design Engineering ($1000):	0	CER
Test and Evaluation ($1000):	0	
Unit Production ($1000):	0	
Reference Quantity (No.):	1	
Factor (N.D.):	1	

Schedule

Development Lead Time Constant (months):	0
Development Lead Time Variable (months):	0
Qualification Lead Time Constant (months):	0
Qualification Lead Time Variable (months):	0
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (1102)

Configurations: Monopropellant

Equipment Type: Tank (PSI 80156-1)

Performance

Technical Characteristics

(1)	Volume:	6.88×10^3 cm^3 (420 in^3)
(2)	Maximum pressure:	4.21×10^6 N/m^2 (610 psia)
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 1.3 (2.9 lb)

Volume (cc): 6.8×10^3 (0.24 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum ($^\circ$K):	333 (140° F)
Minimum ($^\circ$K):	278 (40° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean (x $10^{\pm 9}$ hr):	360
Standard Deviation (x 10^{+9} hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	5

Cost

Design Engineering ($1000):	0	CER
Test and Evaluation ($1000):	0	
Unit Production ($1000):	0	
Reference Quantity (No.):	1	
Factor (N.D.):	1	

Schedule

Development Lead Time Constant (months):	0
Development Lead Time Variable (months):	0
Qualification Lead Time Constant (months):	0
Qualification Lead Time Variable (months):	0
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (1103)

Configurations: Monopropellant

Equipment Type: Tank (PSI 80177-1)

Performance

Technical Characteristics

(1)	Volume:	3.851×10^4 cm^3 (2350 in.^{3})
(2)	Maximum pressure:	2.76×10^6 N/m^2 (400 psia)
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 4.63 (10.2 lb)

Volume (cc): 3.9×10^4 (1.36 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum ($^\circ$K):	333 (140° F)
Minimum ($^\circ$K):	278 (40° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($x\ 10^{\pm 9}$ hr):	360
Standard Deviation ($x\ 10^{+9}$ hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	2

Cost

Design Engineering ($1000):	0	CER
Test and Evaluation ($1000):	0	
Unit Production ($1000):	0	
Reference Quantity (No.):	1	
Factor (N.D.):	1	

Schedule

Development Lead Time Constant (months):	0
Development Lead Time Variable (months):	0
Qualification Lead Time Constant (months):	0
Qualification Lead Time Variable (months):	0
State-of-Art Factor (N.D.):	1

Subsystem: APS (1104)

Configurations: Monopropellant

Equipment Type: Tank (Arde E3848)

Performance

Technical Characteristics

(1)	Volume:	4.547×10^4 cm^3 (2775 in.^{3})
(2)	Maximum pressure:	2.41×10^6 N/m^2 (350 psia)
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 7.7 (17.0 lb)

Volume (cc): 4.2×10^4 (1.60 ft^3)

Vibration

Random (g, rms):	8.3
Non-Random (g):	

Temperature

Maximum ($^\circ$K):	333 (140° F)
Minimum ($^\circ$K):	278 (40° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($x\ 10^{\pm 9}$ hr):	360
Standard Deviation ($x\ 10^{+9}$ hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	3

Cost

Design Engineering ($1000):	0	CER
Test and Evaluation ($1000):	0	
Unit Production ($1000):	0	
Reference Quantity (No.):	1	
Factor (N.D.):	1	

Schedule

Development Lead Time Constant (months):	0
Development Lead Time Variable (months):	0
Qualification Lead Time Constant (months):	0
Qualification Lead Time Variable (months):	0
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (1105)

Configurations: Monopropellant

Equipment Type: Tank (PSI 80112-115)

Performance

Technical Characteristics

(1)	Volume:	9.144×10^4 cm^3 (5580 in.^{3})
(2)	Maximum pressure:	2.41×10^6 N/m^2 (350 psia)
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 7.85 (17.3 lb)

Volume (cc): 9.15×10^4 (3.23 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum ($^\circ$K):	322 (120° F)
Minimum ($^\circ$K):	278 (40° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):		
Time Tagged Commands (No.):		
Other Commands (No.):		
High Rate Telemetry		
Analog Points (No.):		
Digital Points (No.):		
Sample Rate (sec^{-1}):		
Word Length (bits):		
Low Rate Telemetry		
Analog Points (No.):	2	
Digital Points (No.):		
Sample Rate (sec^{-1}):	1	
Word Length (bits):	8	
Safety		
Failure Model (flag):	1	
Failure Parameters		
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	360	
Standard Deviation ($\times 10^{+9}$ hr):		
Dormancy Factor (N.D.):	1.0	
Total Redundant Elements (No.):	3	
Cost		
Design Engineering ($1000):	0	CER
Test and Evaluation ($1000):	0	CER
Unit Production ($1000):	0	CER
Reference Quantity (No.):	1	CER
Factor (N.D.):	1	CER
Schedule		
Development Lead Time Constant (months):	0	
Development Lead Time Variable (months):	0	
Qualification Lead Time Constant (months):	0	
Qualification Lead Time Variable (months):	0	
State-of-Art Factor (N.D.):	1.0	

Subsystem: APS (1201)

Configurations: Monopropellant

Equipment Type: Fill and Drain Valve (TRW DSP)

Performance

Technical Characteristics

(1) Maximum pressure: 3.55×10^6 N/m^2 (515 psia)

(2)

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts): NA

Maximum Power (watts): NA

Minimum Power (watts): NA

Nominal Voltage (volts): NA

Maximum Voltage (volts): NA

Minimum Voltage (volts): NA

Converter/Inverter Requirement (flag):

Weight (kg): 0.09 (0.2 lb)

Volume (cc): 570 (0.02 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^{o}K): 322 (120^o F)

Minimum (^{o}K): 278 (40^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	1	
Failure Parameters		
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	70	
Standard Deviation ($\times 10^{+9}$ hr):		
Dormancy Factor (N.D.):	1.0	
Total Redundant Elements (No.):	1	

Cost

Design Engineering ($1000):	0	CER
Test and Evaluation ($1000):	0	
Unit Production ($1000):	0	
Reference Quantity (No.):	1	
Factor (N.D.):	1	

Schedule

Development Lead Time Constant (months):	0
Development Lead Time Variable (months):	0
Qualification Lead Time Constant (months):	0
Qualification Lead Time Variable (months):	0
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (1202)

Configurations: Monopropellant

Equipment Type: Fill and Drain Valve (Hughes 3181407-110)

Performance

Technical Characteristics

(1) Maximum pressure: 3.45×10^6 N/m^2 (600 psia)

(2)

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts): NA

Maximum Power (watts): NA

Minimum Power (watts): NA

Nominal Voltage (volts): NA

Maximum Voltage (volts): NA

Minimum Voltage (volts): NA

Converter/Inverter Requirement (flag):

Weight (kg): 0.09 (0.2 lb)

Volume (cc): 570 (0.02 ft^3)

Vibration

Random (g, rms): 21.5

Non-Random (g):

Temperature

Maximum ($^\circ$K): 350 (170° F)

Minimum ($^\circ$K): 222 (-60° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	1	
Failure Parameters		
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	70	
Standard Deviation ($\times 10^{+9}$ hr):		
Dormancy Factor (N.D.):	1.0	
Total Redundant Elements (No.):	1	

Cost

Design Engineering ($1000):	0	CER
Test and Evaluation ($1000):	0	CER
Unit Production ($1000):	0	CER
Reference Quantity (No.):	1	CER
Factor (N.D.):	1	CER

Schedule

Development Lead Time Constant (months):	0
Development Lead Time Variable (months):	0
Qualification Lead Time Constant (months):	0
Qualification Lead Time Variable (months):	0
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (1301)

Configurations: Bipropellant

Equipment Type: Thruster (Marquardt R-6C)

Performance

Technical Characteristics

(1)	Thrust level:	22 N (5.0 lb)
(2)	Pulse life:	30,000 cycles
(3)	Inlet pressure:	1.31×10^6 N/m^2 (190 psia)
(4)	Total impulse*:	7.562×10^5 N-sec (170,000 lb-sec)
(5)	ISP*:	278 sec
(6)	Mixture ratio (N.D.)**:	1.5
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	1.0
Maximum Power (watts):	32.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 0.68 (1.5 lb)

Volume (cc): 4.2×10^3 (0.15 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum ($^\circ$K):	394 (250° F)
Minimum ($^\circ$K):	278 (40° F)

Pressure (kg/m^2):

*Applicable to monopropellant and bipropellant thrusters
**Applicable to bipropellant thrusters only

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	5
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	1700
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.1
Total Redundant Elements (No.):	12

Cost

Design Engineering ($1000):	203.0
Test and Evaluation ($1000):	203.0
Unit Production ($1000):	16.0
Reference Quantity (No.):	3
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	4.5
Development Lead Time Variable (months):	1.2
Qualification Lead Time Constant (months):	2.5
Qualification Lead Time Variable (months):	0.1
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (1302)

Configurations: Bipropellant

Equipment Type: Thruster (Aerojet AJ10-181)

Performance

Technical Characteristics

(1)	Thrust level:	22 N (5.0 lb)
(2)	Pulse life:	50,000 cycles
(3)	Inlet pressure:	2.07×10^6 N/m^2 (300 psia)
(4)	Total impulse*:	2.224×10^4 N-sec (5000 lb-sec)
(5)	ISP*:	300 sec
(6)	Mixture ratio (N.D.)**:	1.2
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	1.0
Maximum Power (watts):	30.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 0.54 (1.2 lb)

Volume (cc): 3.4×10^3 (0.12 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum ($^\circ$K):	322 (120° F)
Minimum ($^\circ$K):	266 (20° F)

Pressure (kg/m^2):

*Applicable to monopropellant and bipropellant thrusters
**Applicable to bipropellant thrusters only

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	5
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	1700
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.1
Total Redundant Elements (No.):	12

Cost

Design Engineering ($1000):	171.0
Test and Evaluation ($1000):	171.0
Unit Production ($1000):	13.2
Reference Quantity (No.):	3
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	4.5
Development Lead Time Variable (months):	1.1
Qualification Lead Time Constant (months):	2.5
Qualification Lead Time Variable (months):	0.1
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (1303)

Configurations: Bipropellant

Equipment Type: Thruster (Marquardt R-1E)

Performance

Technical Characteristics

(1)	Thrust level:	98 N (22.0 lb)
(2)	Pulse life:	30,000 cycles
(3)	Inlet pressure:	1.31×10^6 N/m^2 (190 psia)
(4)	Total impulse*:	1.5×10^7 N-sec (3.4×10^6 lb-sec)
(5)	ISP*:	276 sec
(6)	Mixture ratio (N.D.)**:	1.6
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	1.0
Maximum Power (watts):	32.0
Minimum Power (watts):	0
Nominal Voltage (volts):	27.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	22.0
Converter/Inverter Requirement (flag):	

Weight (kg): 1.3 (2.9 lb)

Volume (cc): 8.2×10^3 (0.29 ft^3)

Vibration

Random (g, rms):	26.0
Non-Random (g):	

Temperature

Maximum ($^\circ$K):	394 (250° F)
Minimum ($^\circ$K):	278 (40° F)

Pressure (kg/m^2):

*Applicable to monopropellant and bipropellant thrusters
**Applicable to bipropellant thrusters only

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	5
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	1700
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.1
Total Redundant Elements (No.):	12

Cost

Design Engineering ($1000):	333.0
Test and Evaluation ($1000):	333.0
Unit Production ($1000):	26.8
Reference Quantity (No.):	3
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	4.5
Development Lead Time Variable (months):	1.6
Qualification Lead Time Constant (months):	2.5
Qualification Lead Time Variable (months):	0.2
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (1304)

Configurations: Bipropellant

Equipment Type: Thruster (Bell MM P/Y)

Performance

Technical Characteristics

(1)	Thrust level:	100 N (23.0 lb)
(2)	Pulse life:	30,000 cycles
(3)	Inlet pressure:	1.67×10^6 N/m^2 (242 psia)
(4)	Total impulse*:	2.002×10^4 N-sec (4500 lb-sec)
(5)	ISP*:	288 sec
(6)	Mixture ratio (N.D.)**:	1.6
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	1.0
Maximum Power (watts):	30.0
Minimum Power (watts):	0
Nominal Voltage (volts):	27.0
Maximum Voltage (volts):	30.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 1.2 (2.7 lb)

Volume (cc): 7.6×10^3 (0.27 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum ($^\circ$K):	303 (85° F)
Minimum ($^\circ$K):	289 (60° F)

Pressure (kg/m^2):

*Applicable to monopropellant and bipropellant thrusters
**Applicable to bipropellant thrusters only

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	5
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	1700
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.1
Total Redundant Elements (No.):	12

Cost

Design Engineering ($1000):	315.0
Test and Evaluation ($1000):	315.0
Unit Production ($1000):	25.1
Reference Quantity (No.):	3
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	4.5
Development Lead Time Variable (months):	1.5
Qualification Lead Time Constant (months):	2.5
Qualification Lead Time Variable (months):	0.2
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (1305)

Configurations: Bipropellant

Equipment Type: Thruster (TRW MMBPS)

Performance

Technical Characteristics

(1)	Thrust level:	390 N (88.0 lb)
(2)	Pulse life (cycles):	
(3)	Inlet pressure (psia):	
(4)	Total impulse*:	4.4×10^6 N-sec (1.0×10^6 lb-sec)
(5)	ISP*:	295 sec
(6)	Mixture ratio (N.D.)**:	1.6
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	1.0
Maximum Power (watts):	30.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 2.6 (5.8 lb)

Volume (cc): 1.6×10^4 (0.58 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	333 (140° F)
Minimum (^oK):	278 (40° F)

Pressure (kg/m^2):

*Applicable to monopropellant and bipropellant thrusters
**Applicable to bipropellant thrusters only

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety	
Failure Model (flag):	5
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	1700
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.1
Total Redundant Elements (No.):	12
Cost	
Design Engineering ($1000):	560.0
Test and Evaluation ($1000):	560.0
Unit Production ($1000):	46.1
Reference Quantity (No.):	3
Factor (N.D.):	1
Schedule	
Development Lead Time Constant (months):	4.5
Development Lead Time Variable (months):	1.9
Qualification Lead Time Constant (months):	2.5
Qualification Lead Time Variable (months):	0.3
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (1306)

Configurations: Bipropellant

Equipment Type: Thruster (Marquardt R-4D)

Performance

Technical Characteristics

(1)	Thrust level:	445 N (100.0 lb)
(2)	Pulse life:	30,000 cycles
(3)	Inlet pressure:	1.31×10^6 N/m^2 (190 psia)
(4)	Total impulse*:	8.9×10^6 N-sec (2.0×10^6 lb-sec)
(5)	ISP*:	290 sec
(6)	Mixture ratio (N.D.)**:	1.6
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	1.0
Maximum Power (watts):	112.0
Minimum Power (watts):	0
Nominal Voltage (volts):	27.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	22.0
Converter/Inverter Requirement (flag):	

Weight (kg): 2.2 (4.9 lb)

Volume (cc): 1.4×10^4 (0.49 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum ($^\circ$K):	380 (225° F)
Minimum ($^\circ$K):	278 (40° F)

Pressure (kg/m^2):

*Applicable to monopropellant and bipropellant thrusters
**Applicable to bipropellant thrusters only

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	5
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	1700
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.1
Total Redundant Elements (No.):	12

Cost

Design Engineering ($1000):	498.0
Test and Evaluation ($1000):	498.0
Unit Production ($1000):	40.4
Reference Quantity (No.):	3
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	4.5
Development Lead Time Variable (months):	1.9
Qualification Lead Time Constant (months):	2.5
Qualification Lead Time Variable (months):	0.3
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (1307)

Configurations: Bipropellant

Equipment Type: Thruster (Rocketdyne RS-2101-C)

Performance

Technical Characteristics

(1)	Thrust level:	1330 N (300.0 lb)
(2)	Pulse life (cycles):	
(3)	Inlet pressure:	1.59×10^6 N/m^2 (230 psia)
(4)	Total impulse*:	1.3×10^7 N-sec (3.0×10^6 lb-sec)
(5)	ISP*:	293 sec
(6)	Mixture ratio (N. D.)**:	1.5
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	1.0
Maximum Power (watts):	13.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 7.03 (15.5 lb)

Volume (cc): 4.2×10^4 (1.5 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum ($^\circ$K):	303 (85° F)
Minimum ($^\circ$K):	286 (55° F)

Pressure (kg/m^2):

*Applicable to monopropellant and bipropellant thrusters
**Applicable to bipropellant thrusters only

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	5
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	1700
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.1
Total Redundant Elements (No.):	12

Cost

Design Engineering ($1000):	1200.0
Test and Evaluation ($1000):	1200.0
Unit Production ($1000):	100.0
Reference Quantity (No.):	3
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	4.5
Development Lead Time Variable (months):	3.7
Qualification Lead Time Constant (months):	2.5
Qualification Lead Time Variable (months):	0.8
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (1308)

Configurations: Bipropellant

Equipment Type: Thruster (Rocketdyne SS/RCS)

Performance

Technical Characteristics

(1)	Thrust level:	2670 N (600.0 lb)
(2)	Pulse life:	200,000 cycles
(3)	Inlet pressure:	2.07×10^6 N/m^2 (300 psia)
(4)	Total impulse*:	2.67×10^8 N-sec (6.0×10^7 lb-sec)
(5)	ISP*:	295 sec
(6)	Mixture ratio (N.D.)**:	1.6
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	1.0
Maximum Power (watts):	12.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 7.89 (17.4 lb)

Volume (cc): 4.8×10^4 (1.7 ft^3)

Vibration

Random (g, rms):	55.0
Non-Random (g):	

Temperature

Maximum ($^\circ$K):	316 (110° F)
Minimum ($^\circ$K):	278 (40° F)

Pressure (kg/m^2):

*Applicable to monopropellant and bipropellant thrusters
**Applicable to bipropellant thrusters only

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	5
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	1700
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.1
Total Redundant Elements (No.):	12

Cost

Design Engineering ($1000):	1300.0
Test and Evaluation ($1000):	1300.0
Unit Production ($1000):	112.0
Reference Quantity (No.):	3
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	4.5
Development Lead Time Variable (months):	3.7
Qualification Lead Time Constant (months):	2.5
Qualification Lead Time Variable (months):	0.8
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (1401)

Configurations: Bipropellant

Equipment Type: Isolation Valve (latching solenoid) (Marquardt T8700)

Performance

Technical Characteristics

(1)	Maximum pressure:	2.34×10^6 N/m^2 (340 psia)
(2)	Flow area:	0.04 cm^2 (0.006 in.^{2})
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	0
Maximum Power (watts):	56
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 0.3 (0.6 lb)

Volume (cc): 1.7×10^3 (0.06 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum ($^\circ$K):	380 (225° F)
Minimum ($^\circ$K):	278 (40° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):		
Time Tagged Commands (No.):		
Other Commands (No.):	1	
High Rate Telemetry		
Analog Points (No.):		
Digital Points (No.):		
Sample Rate (sec^{-1}):		
Word Length (bits):		
Low Rate Telemetry		
Analog Points (No.):		
Digital Points (No.):		
Sample Rate (sec^{-1}):		
Word Length (bits):		

Safety

Failure Model (flag):	1	
Failure Parameters		
Failure Rate or Mean (x $10^{\pm 9}$ hr):	200	
Standard Deviation (x 10^{+9} hr):		
Dormancy Factor (N.D.):	1.0	
Total Redundant Elements (No.):	7	

Cost

Design Engineering ($1000):	0	CER
Test and Evaluation ($1000):	0	CER
Unit Production ($1000):	0	CER
Reference Quantity (No.):	1	CER
Factor (N.D.):	1	CER

Schedule

Development Lead Time Constant (months):	0
Development Lead Time Variable (months):	0
Qualification Lead Time Constant (months):	0
Qualification Lead Time Variable (months):	0
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (1402)

Configurations: Bipropellant

Equipment Type: Isolation Valve (latching solenoid) (Marquardt 22700)

Performance

Technical Characteristics

(1) Maximum pressure: 2.48×10^6 N/m^2 (360 psia)

(2) Flow area: 0.62 cm^2 (0.096 in.^{2})

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts): 0

Maximum Power (watts): 60.0

Minimum Power (watts): 0

Nominal Voltage (volts): 27.0

Maximum Voltage (volts): 30.0

Minimum Voltage (volts): 24.0

Converter/Inverter Requirement (flag):

Weight (kg): 0.59 (1.3 lb)

Volume (cc): 3.7×10^3 (0.13 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum ($^\circ$K): 322 (120° F)

Minimum ($^\circ$K): 278 (40° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry 1

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag): 1

Failure Parameters

Failure Rate or Mean ($\times 10^{\pm 9}$ hr): 200

Standard Deviation ($\times 10^{+9}$ hr):

Dormancy Factor (N.D.): 1.0

Total Redundant Elements (No.): 7

Cost

Design Engineering ($1000): 0

Test and Evaluation ($1000): 0

Unit Production ($1000): 0 } CER

Reference Quantity (No.): 1

Factor (N.D.): 1

Schedule

Development Lead Time Constant (months): 0

Development Lead Time Variable (months): 0

Qualification Lead Time Constant (months): 0

Qualification Lead Time Variable (months): 0

State-of-Art Factor (N.D.): 1.0

Subsystem: APS (1403)

Configurations: Bipropellant

Equipment Type: Isolation Valve (latching solenoid)
(Consolidated Controls 73295)

Performance

Technical Characteristics

(1)	Maximum pressure:	2.48×10^6 N/m^2 (360 psia)
(2)	Flow area:	0.13 cm^2 (0.02 in.^{2})
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	0
Maximum Power (watts):	108.0
Minimum Power (watts):	0
Nominal Voltage (volts):	25.0
Maximum Voltage (volts):	30.0
Minimum Voltage (volts):	20.0
Converter/Inverter Requirement (flag):	

Weight (kg): 1.2 (2.7 lb)

Volume (cc): 7.6×10^3 (0.27 ft^3)

Vibration

Random (g, rms):	23.2
Non-Random (g):	

Temperature

Maximum ($^\circ$K):	305 (90° F)
Minimum ($^\circ$K):	244 (-20° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	1
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	100
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	7

Cost

Design Engineering ($1000):	0	CER
Test and Evaluation ($1000):	0	
Unit Production ($1000):	0	
Reference Quantity (No.):	1	
Factor (N.D.):	1	

Schedule

Development Lead Time Constant (months):	0
Development Lead Time Variable (months):	0
Qualification Lead Time Constant (months):	0
Qualification Lead Time Variable (months):	0
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (1404)

Configurations: Bipropellant

Equipment Type: Isolation Valve (latching solenoid) (Valcor 27700-61)

Performance

Technical Characteristics

(1)	Maximum pressure:	3.00×10^6 N/m^2 (435 psia)
(2)	Flow area:	2.9 cm^2 (0.45 in^2)
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	0
Maximum Power (watts):	110.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg):	2.7 (6.0 lb)
Volume (cc):	1.7×10^4 (0.6 ft^3)

Vibration

Random (g, rms):	15.0
Non-Random (g):	

Temperature

Maximum ($^\circ$K):	322 (120° F)
Minimum ($^\circ$K):	266 (20° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.): 1

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag): 1

Failure Parameters

Failure Rate or Mean ($\times 10^{\pm 9}$ hr): 100

Standard Deviation ($\times 10^{+9}$ hr):

Dormancy Factor (N.D.): 1.0

Total Redundant Elements (No.): 7

Cost

Design Engineering ($1000): 0

Test and Evaluation ($1000): 0

Unit Production ($1000): 0

Reference Quantity (No.): 1

Factor (N.D.): 1

CER

Schedule

Development Lead Time Constant (months): 0

Development Lead Time Variable (months): 0

Qualification Lead Time Constant (months): 0

Qualification Lead Time Variable (months): 0

State-of-Art Factor (N.D.): 1.0

Subsystem: APS (1405)

Configurations: Bipropellant

Equipment Type: Isolation Valve (pyrotechnic)(Pyronetics 1349)

Performance

Technical Characteristics

(1)	Maximum pressure:	2.758×10^7 N/m^2 (4000 psia)
(2)	Flow area:	7.7 cm^2 (1.2 in^2)
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	0
Maximum Power (watts):	140.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 0.68 (1.5 lb)

Volume (cc): 4.2×10^3 (0.15 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum ($^\circ$K):	325 (125° F)
Minimum ($^\circ$K):	219 (-65° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.): 1

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag): 1

Failure Parameters

Failure Rate or Mean ($\times 10^{\pm 9}$ hr): 100

Standard Deviation ($\times 10^{+9}$ hr):

Dormancy Factor (N.D.): 1.0

Total Redundant Elements (No.): 7

Cost

Design Engineering ($1000): 0

Test and Evaluation ($1000): 0

Unit Production ($1000): 0 CER

Reference Quantity (No.): 1

Factor (N.D.): 1

Schedule

Development Lead Time Constant (months): 0

Development Lead Time Variable (months): 0

Qualification Lead Time Constant (months): 0

Qualification Lead Time Variable (months): 0

State-of-Art Factor (N.D.): 1.0

Subsystem: APS (1501)

Configurations: Bipropellant

Equipment Type: Filter (Wintec 15267)

Performance

Technical Characteristics

(1) Maximum pressure: 2.76×10^6 N/m^2 (400 psia)

(2) Flow resistance: 1.37×10^8 N/(kg-m)^2 (4.08 psi sec^2/lb^2)

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts): NA

Maximum Power (watts): NA

Minimum Power (watts): NA

Nominal Voltage (volts): NA

Maximum Voltage (volts): NA

Minimum Voltage (volts): NA

Converter/Inverter Requirement (flag):

Weight (kg): 1.4 (3.0 lb)

Volume (cc): 8.5×10^3 (0.3 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum ($^\circ$K): 333 (140° F)

Minimum ($^\circ$K): 278 (40° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	10
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	7

Cost

Design Engineering ($1000):	0	
Test and Evaluation ($1000):	0	
Unit Production ($1000):	0	CER
Reference Quantity (No.):	1	
Factor (N.D.):	1	

Schedule

Development Lead Time Constant (months):	0
Development Lead Time Variable (months):	0
Qualification Lead Time Constant (months):	0
Qualification Lead Time Variable (months):	0
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (1601)

Configurations: Bipropellant

Equipment Type: Tank (Arde MM-3)

Performance

Technical Characteristics

(1)	Volume:	1.27×10^4 cm^3 (775 in^3)
(2)	Maximum pressure:	5.65×10^6 N/m^2 (820 psia)
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 2.9 (6.5 lb)

Volume (cc): 1.3×10^4 (0.47 ft^3)

Vibration

Random (g, rms):	8.3
Non-Random (g):	

Temperature

Maximum ($^\circ$K):	700 (800° F)
Minimum ($^\circ$K):	266 (20° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.): 2

Digital Points (No.):

Sample Rate (sec^{-1}): 1

Word Length (bits): 8

Safety

Failure Model (flag): 1

Failure Parameters

Failure Rate or Mean ($\times 10^{\pm 9}$ hr): 360

Standard Deviation ($\times 10^{+9}$ hr):

Dormancy Factor (N.D.): 1.0

Total Redundant Elements (No.): 5

Cost

Design Engineering ($1000): 0

Test and Evaluation ($1000): 0

Unit Production ($1000): 0 } CER

Reference Quantity (No.): 1

Factor (N.D.): 1

Schedule

Development Lead Time Constant (months): 0

Development Lead Time Variable (months): 0

Qualification Lead Time Constant (months): 0

Qualification Lead Time Variable (months): 0

State-of-Art Factor (N.D.): 1.0

Subsystem: APS (1602)

Configurations: Bipropellant

Equipment Type: Tank (Arde E3840)

Performance

Technical Characteristics

(1)	Volume:	4.424×10^4 cm^3 (2700 in^3)
(2)	Maximum pressure:	2.41×10^6 N/m^2 (350 psia)
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 7.7 (17.0 lb)

Volume (cc): 5.01×10^4 (1.77 ft^3)

Vibration

Random (g, rms):	8.3
Non-Random (g):	

Temperature

Maximum ($^\circ$K):	700 (800° F)
Minimum ($^\circ$K):	266 (20° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.): 2

Digital Points (No.):

Sample Rate (sec^{-1}): 1

Word Length (bits): 8

Safety

Failure Model (flag): 1

Failure Parameters

Failure Rate or Mean ($\times 10^{\pm 9}$ hr): 360

Standard Deviation ($\times 10^{+9}$ hr):

Dormancy Factor (N.D.): 1.0

Total Redundant Elements (No.): 2

Cost

Design Engineering ($1000): 0

Test and Evaluation ($1000): 0

Unit Production ($1000): 0

Reference Quantity (No.): 1

Factor (N.D.): 1

} CER

Schedule

Development Lead Time Constant (months): 0

Development Lead Time Variable (months): 0

Qualification Lead Time Constant (months): 0

Qualification Lead Time Variable (months): 0

State-of-Art Factor (N.D.): 1.0

Subsystem: APS (1603)

Configurations: Bipropellant

Equipment Type: Tank (PSI 80123-1)

Performance

Technical Characteristics

(1)	Volume:	1.131×10^5 cm^3 (6900 in^3)
(2)	Maximum pressure:	1.38×10^6 N/m^2 (200 psia)
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 4.76 (10.5 lb)

Volume (cc): 1.16×10^5 (4.10 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum ($^\circ$K):	344 (160° F)
Minimum ($^\circ$K):	266 (20° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	360
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	3

Cost

Design Engineering ($1000):	0	
Test and Evaluation ($1000):	0	
Unit Production ($1000):	0	CER
Reference Quantity (No.):	1	
Factor (N.D.):	1	

Schedule

Development Lead Time Constant (months):	0
Development Lead Time Variable (months):	0
Qualification Lead Time Constant (months):	0
Qualification Lead Time Variable (months):	0
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (1604)

Configurations: Bipropellant

Equipment Type: Tank (PSI 80140-1)

Performance

Technical Characteristics

(1)	Volume	2.130×10^5 cm^3 (13,000 in^3)
(2)	Maximum pressure:	2.07×10^6 N/m^2 (300 psia)
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 10.2 (22.5 lb)

Volume (cc): 2.20×10^5 (7.78 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum ($^\circ$K):	344 (160° F)
Minimum ($^\circ$K):	266 (20° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	360
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	3

Cost

Design Engineering ($1000):	0	CER
Test and Evaluation ($1000):	0	
Unit Production ($1000):	0	
Reference Quantity (No.):	1	
Factor (N.D.):	1	

Schedule

Development Lead Time Constant (months):	0
Development Lead Time Variable (months):	0
Qualification Lead Time Constant (months):	0
Qualification Lead Time Variable (months):	0
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (1605)

Configurations: Bipropellant

Equipment Type: Tank (Arde)

Performance

Technical Characteristics

(1)	Volume:	5.080×10^5 cm^3 (31,000 in^3)
(2)	Maximum pressure:	
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 68.0 (150.0 lb)

Volume (cc): 5.24×10^5 (18.5 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum ($^\circ$K):	700 (800° F)
Minimum ($^\circ$K):	266 (20° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	360
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	3

Cost

Design Engineering ($1000):	0	
Test and Evaluation ($1000):	0	
Unit Production ($1000):	0	CER
Reference Quantity (No.):	1	
Factor (N.D.):	1	

Schedule

Development Lead Time Constant (months):	0
Development Lead Time Variable (months):	0
Qualification Lead Time Constant (months):	0
Qualification Lead Time Variable (months):	0
State-of-Art Factor (N.D.):	1.0

Subsystem: APS (1701)

Configurations: Bipropellant

Equipment Type: Fill and Drain Valve (Pyronetics 1831)

Performance

Technical Characteristics

(1) Maximum pressure: 3.72×10^6 N/m^2 (540 psia)

(2)

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 0.09 (0.2 lb)

Volume (cc): 570 (0.02 ft^3)

Vibration

Random (g, rms):	14.8
Non-Random (g):	

Temperature

Maximum ($^\circ$K):	394 (250° F)
Minimum ($^\circ$K):	233 (-40° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	1	
Failure Parameters		
Failure Rate or Mean (x $10^{\pm 9}$ hr):	70	
Standard Deviation (x 10^{+9} hr):		
Dormancy Factor (N.D.):	1.0	
Total Redundant Elements (No.):	1	

Cost

Design Engineering ($1000):	0	CER
Test and Evaluation ($1000):	0	CER
Unit Production ($1000):	0	CER
Reference Quantity (No.):	1	CER
Factor (N.D.):	1	CER

Schedule

Development Lead Time Constant (months):	0
Development Lead Time Variable (months):	0
Qualification Lead Time Constant (months):	0
Qualification Lead Time Variable (months):	0
State-of-Art Factor (N.D.):	1.0

Subsystem: DP (0101)

Configurations: General Purpose Processors

Equipment Type: General Purpose Processor (CDC 469)

Performance

Technical Characteristics

(1) Instruction rate: 160 (kips)

(2) Word length: 16 (bits)

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts): 15.0

Maximum Power (watts): 15.0

Minimum Power (watts): 0

Nominal Voltage (volts): 28.0

Maximum Voltage (volts): 32.0

Minimum Voltage (volts): 24.0

Converter/Inverter Requirement (flag):

Weight (kg): 1.3 (2.8 lb)

Volume (cc): 990 (0.035 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK): 311 (100^o F)

Minimum (^oK): 275 (35^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	20
High Rate Telemetry	
Analog Points (No.):	6
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	15,000
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	2

Cost

Design Engineering ($1000):	2500
Test and Evaluation ($1000):	1000
Unit Production ($1000):	650
Reference Quantity (No.):	1
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	24.0
Development Lead Time Variable (months):	8.0
Qualification Lead Time Constant (months):	6.0
Qualification Lead Time Variable (months):	4.7
State-of-Art Factor (N.D.):	2.0

Subsystem: DP (0102)

Configurations: General Purpose Processors

Equipment Type: General Purpose Processor (RCA MARC)

Performance

Technical Characteristics

(1) Instruction rate: 200 kips

(2) Word length: 32 bits

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts): 20.0

Maximum Power (watts): 20.0

Minimum Power (watts): 0

Nominal Voltage (volts): 28.0

Maximum Voltage (volts): 32.0

Minimum Voltage (volts): 24.0

Converter/Inverter Requirement (flag):

Weight (kg): 6.8 (15.0 lb)

Volume (cc): 2.1×10^3 ($0.075\ ft^3$)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK): 311 (100^o F)

Minimum (^oK): 275 (35^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	20
High Rate Telemetry	
Analog Points (No.):	6
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	15,000
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	2

Cost

Design Engineering ($1000):	1850
Test and Evaluation ($1000):	1150
Unit Production ($1000):	1000
Reference Quantity (No.):	1
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	24.0
Development Lead Time Variable (months):	8.0
Qualification Lead Time Constant (months):	6.0
Qualification Lead Time Variable (months):	4.1
State-of-Art Factor (N.D.):	2.0

Subsystem: DP (0103)

Configurations: General Purpose Processors

Equipment Type: General Purpose Processor (Autonetics D216)

Performance

Technical Characteristics

(1)	Instruction rate:	250 kips
(2)	Word length:	16 bits
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	80.0
Maximum Power (watts):	80.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 6.8 (15.0 lb)

Volume (cc): 2.0×10^3 (0.069 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100^o F)
Minimum (^oK):	275 (35^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.): 20

High Rate Telemetry

Analog Points (No.): 6

Digital Points (No.):

Sample Rate (sec^{-1}): 1

Word Length (bits): 8

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag): 1

Failure Parameters

Failure Rate or Mean ($\times 10^{\pm 9}$ hr): 15,000

Standard Deviation ($\times 10^{+9}$ hr):

Dormancy Factor (N.D.): 0.5

Total Redundant Elements (No.): 2

Cost

Design Engineering ($1000): 1850

Test and Evaluation ($1000): 1150

Unit Production ($1000): 1000

Reference Quantity (No.): 1

Factor (N.D.): 1

Schedule

Development Lead Time Constant (months): 24.0

Development Lead Time Variable (months): 8.0

Qualification Lead Time Constant (months): 6.0

Qualification Lead Time Variable (months): 4.1

State-of-Art Factor (N.D.): 2.0

Subsystem: DP (0104)

Configurations: General Purpose Processors

Equipment Type: General Purpose Processor (Bunker Ramo 1018)

Performance

Technical Characteristics

(1) Instruction rate: 300 kips

(2) Word length: 16 bits

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts): 40.0

Maximum Power (watts): 40.0

Minimum Power (watts): 0

Nominal Voltage (volts): 28.0

Maximum Voltage (volts): 32.0

Minimum Voltage (volts): 24.0

Converter/Inverter Requirement (flag):

Weight (kg): 5.4 (12.0 lb)

Volume (cc): 2.94×10^3 ($0.104\ ft^3$)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK): 311 ($100^o F$)

Minimum (^oK): 275 ($35^o F$)

Pressure (kg/m^2):

Performance (continued)

CDPI	
Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	20
High Rate Telemetry	
Analog Points (No.):	6
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Safety	
Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean (x $10^{\pm 9}$ hr):	15,000
Standard Deviation (x 10^{+9} hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	2
Cost	
Design Engineering ($1000):	2150
Test and Evaluation ($1000):	1400
Unit Production ($1000):	850
Reference Quantity (No.):	1
Factor (N.D.):	1
Schedule	
Development Lead Time Constant (months):	24.0
Development Lead Time Variable (months):	8.0
Qualification Lead Time Constant (months):	6.0
Qualification Lead Time Variable (months):	4.8
State-of-Art Factor (N.D.):	2.0

Subsystem: DP (0105)

Configurations: General Purpose Processors

Equipment Type: General Purpose Processor (Northrop RCTOT)

Performance

Technical Characteristics

(1) Instruction rate: 500 kips

(2) Word length: 24 bits

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts): 50.0

Maximum Power (watts): 50.0

Minimum Power (watts): 0

Nominal Voltage (volts): 28.0

Maximum Voltage (volts): 32.0

Minimum Voltage (volts): 24.0

Converter/Inverter Requirement (flag):

Weight (kg): 6.8 (15.0 lb)

Volume (cc): 2.5×10^3 (0.087 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK): 311 (100^o F)

Minimum (^oK): 275 (35^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	20
High Rate Telemetry	
Analog Points (No.):	6
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	15,000
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	2

Cost

Design Engineering ($1000):	2680
Test and Evaluation ($1000):	1667
Unit Production ($1000):	1000
Reference Quantity (No.):	1
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	24.0
Development Lead Time Variable (months):	9.0
Qualification Lead Time Constant (months):	6.0
Qualification Lead Time Variable (months):	5.9
State-of-Art Factor (N.D.):	2.0

Subsystem: DP (0106)

Configurations: General Purpose Processors

Equipment Type: General Purpose Processor (Autonetics D224)

Performance

Technical Characteristics

(1) Instruction rate: 750 kips

(2) Word length: 24 bits

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts): 140.0

Maximum Power (watts): 140.0

Minimum Power (watts): 0

Nominal Voltage (volts): 28.0

Maximum Voltage (volts): 32.0

Minimum Voltage (volts): 24.0

Converter/Inverter Requirement (flag):

Weight (kg): 11 (25.0 lb)

Volume (cc): 820 (0.029 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK): 311 (100^o F)

Minimum (^oK): 275 (35^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	20
High Rate Telemetry	
Analog Points (No.):	6
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	15,000
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	2

Cost

Design Engineering ($1000):	3360
Test and Evaluation ($1000):	2310
Unit Production ($1000):	1400
Reference Quantity (No.):	1
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	24.0
Development Lead Time Variable (months):	10.0
Qualification Lead Time Constant (months):	6.0
Qualification Lead Time Variable (months):	7.7
State-of-Art Factor (N.D.):	2.0

Subsystem: DP (0107)

Configurations: General Purpose Processors

Equipment Type: General Purpose Processor (RCA SMARC)

Performance

Technical Characteristics

(1) Instruction rate: 1000 kips

(2) Word length: 32 bits

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts): 40.0

Maximum Power (watts): 40.0

Minimum Power (watts): 0

Nominal Voltage (volts): 28.0

Maximum Voltage (volts): 32.0

Minimum Voltage (volts): 24.0

Converter/Inverter Requirement (flag):

Weight (kg): 11 (25.0 lb)

Volume (cc): 2.1×10^3 (0.075 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK): 311 (100^oF)

Minimum (^oK): 275 (35^oF)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	20
High Rate Telemetry	
Analog Points (No.):	6
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	15,000
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	2

Cost

Design Engineering ($1000):	3960
Test and Evaluation ($1000):	2725
Unit Production ($1000):	1400
Reference Quantity (No.):	1
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	24.0
Development Lead Time Variable (months):	13.0
Qualification Lead Time Constant (months):	6.0
Qualification Lead Time Variable (months):	9.1
State-of-Art Factor (N.D.):	2.0

Subsystem: DP (0108)

Configurations: General Purpose Processors

Equipment Type: General Purpose Processor (CDC AMPP)

Performance

Technical Characteristics

(1) Instruction rate: 1200 kips

(2) Word length: 32 bits

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts): 100.0

Maximum Power (watts): 100.0

Minimum Power (watts): 0

Nominal Voltage (volts): 28.0

Maximum Voltage (volts): 32.0

Minimum Voltage (volts): 24.0

Converter/Inverter Requirement (flag):

Weight (kg): 9.1 (20.0 lb)

Volume (cc): 2.0×10^3 ($0.069\ ft^3$)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK): 311 (100^o F)

Minimum (^oK): 275 (35^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	20
High Rate Telemetry	
Analog Points (No.):	6
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean (x $10^{\pm 9}$ hr):	15,000
Standard Deviation (x 10^{+9} hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	2

Cost

Design Engineering ($1000):	4300
Test and Evaluation ($1000):	2850
Unit Production ($1000):	1200
Reference Quantity (No.):	1
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	24.0
Development Lead Time Variable (months):	14.0
Qualification Lead Time Constant (months):	6.0
Qualification Lead Time Variable (months):	9.8
State-of-Art Factor (N.D.):	2.0

Subsystem: DP (0201)

Configurations: All

Equipment Type: Digital Telemetry Unit

Performance

Technical Characteristics

(1)	Bit rate:	0.250 kbps
(2)	Word length:	8 bits
(3)	Number of main frame words:	32
(4)	Number of subframes:	4
(5)	Number of words per subframe:	128
(6)	Digital multiplexer (yes/no):	Yes (1)
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	3.0
Maximum Power (watts):	3.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	23.0
Minimum Voltage (volts):	20.0
Converter/Inverter Requirement (flag):	

Weight (kg): 4.7 (10.4 lb)

Volume (cc): 2.8×10^4 (1.0 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	316 (110° F)
Minimum (^oK):	255 (0° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	1
Sample Rate (sec^{-1}):	1
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	1
Digital Points (No.):	4
Sample Rate (sec^{-1}):	0.0075
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	18,302
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	2

Cost

Design Engineering ($1000):	210.0
Test and Evaluation ($1000):	97.0
Unit Production ($1000):	35.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	6.2
Development Lead Time Variable (months):	2.7
Qualification Lead Time Constant (months):	1.8
Qualification Lead Time Variable (months):	0.2
State-of-Art Factor (N.D.):	1.0

Subsystem: DP (0202)

Configurations: All

Equipment Type: Digital Telemetry Unit

Performance

Technical Characteristics

(1)	Bit rate:	128 kbps
(2)	Word length:	8 bits
(3)	Number of main frame words:	128
(4)	Number of subframes:	4
(5)	Number of words per subframe:	128
(6)	Digital multiplexer (yes/no):	Yes (1)
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	3.0
Maximum Power (watts):	3.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	33.0
Minimum Voltage (volts):	20.0
Converter/Inverter Requirement (flag):	

Weight (kg): 4.1 (9.0 lb)

Volume (cc): 2.5×10^4 ($0.9\ ft^3$)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK): 316 (110^o F)

Minimum (^oK): 255 (0^o F)

Pressure (kg/m^2):

Performance (continued)	
CDPI	
Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	1
Sample Rate (sec^{-1}):	125
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	4
Digital Points (No.):	1
Sample Rate (sec^{-1}):	1
Word Length (bits):	8
Safety	
Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	18,302
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	2
Cost	
Design Engineering ($1000):	500.0
Test and Evaluation ($1000):	175.0
Unit Production ($1000):	95.0
Reference Quantity (No.):	2
Factor (N.D.):	1
Schedule	
Development Lead Time Constant (months):	6.2
Development Lead Time Variable (months):	4.5
Qualification Lead Time Constant (months):	1.8
Qualification Lead Time Variable (months):	0.4
State-of-Art Factor (N.D.):	1.0

Subsystem: DP (0301)

Configurations: All

Equipment Type: Tape Recorder (AF/NE Univ.)

Performance

Technical Characteristics

(1)	Capacity:	6.5×10^5 bits
(2)	Equivalent length:	122 m (400 ft)
(3)	Density:	59.1 bits/cm (150 bits/in.)
(4)	Record rate:	1 cm/sec (0.4 in./sec)
(5)	Reproduce rate:	18 cm/sec (7.2 in./sec)
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	3.0
Maximum Power (watts):	5.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 4.4 (9.6 lb)

Volume (cc): 5.89×10^3 (0.208 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100° F)
Minimum (^oK):	275 (35° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	1
Time Tagged Commands (No.):	
Other Commands (No.):	5
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	6
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	1600
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	305.0
Test and Evaluation ($1000):	252.0
Unit Production ($1000):	265.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	12.0
Development Lead Time Variable (months):	8.3
Qualification Lead Time Constant (months):	8.0
Qualification Lead Time Variable (months):	1.6
State-of-Art Factor (N.D.):	1.0

Subsystem: DP (0302)

Configurations: All

Equipment Type: Tape Recorder (CNES/D2B)

Performance

Technical Characteristics

(1)	Capacity:	1.6×10^6 bits
(2)	Equivalent length:	152 m (500 ft)
(3)	Density:	133 bits/cm (338 bits/in.)
(4)	Record rate:	1.9 cm/sec (0.74 in./sec)
(5)	Reproduce rate:	61.5 cm/sec (24.2 in./sec)
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	4.5
Maximum Power (watts):	7.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 4.99 (11.0 ft)

Volume (cc): 6.48×10^3 (0.229 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100° F)
Minimum (^oK):	275 (35° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	1
Time Tagged Commands (No.):	
Other Commands (No.):	5
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	6
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	1600
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	334.0
Test and Evaluation ($1000):	271.0
Unit Production ($1000):	285.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	12.0
Development Lead Time Variable (months):	8.3
Qualification Lead Time Constant (months):	8.0
Qualification Lead Time Variable (months):	1.6
State-of-Art Factor (N.D.):	1.0

Subsystem: DP (0303)

Configurations: All

Equipment Type: Tape Recorder (NASA/ISS)

Performance

Technical Characteristics

(1)	Capacity:	7.1×10^6 bits
(2)	Equivalent length:	142 m (360 ft)
(3)	Density:	4318 bits/cm (1700 bits/in.)
(4)	Record rate:	1.5 cm/sec (0.6 in./sec)
(5)	Reproduce rate:	39.6 cm/sec (15.6 in./sec)
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	4.0
Maximum Power (watts):	8.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 4.99 (11.0 lb)

Volume (cc): 6.40×10^3 (0.226 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100° F)
Minimum (^oK):	275 (35° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	1
Time Tagged Commands (No.):	
Other Commands (No.):	5
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	6
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	1600
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	334.0
Test and Evaluation ($1000):	271.0
Unit Production ($1000):	285.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	12.0
Development Lead Time Variable (months):	8.3
Qualification Lead Time Constant (months):	8.0
Qualification Lead Time Variable (months):	1.6
State-of-Art Factor (N.D.):	1.0

Subsystem: DP (0304)

Configurations: All

Equipment Type: Tape Recorder (NASA/AE)

Performance

Technical Characteristics

(1)	Capacity:	1.2×10^8 bits
(2)	Equivalent length:	336 m (1200 ft)
(3)	Density:	1614 bits/cm (4100 bits/in.)
(4)	Record rate:	10 cm/sec (4.0 in./sec)
(5)	Reproduce rate:	81 cm/sec (32 in./sec)
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	6.5
Maximum Power (watts):	11.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 7.26 (16.0 lb)

Volume (cc): 1.23×10^4 (0.434 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100° F)
Minimum (^oK):	275 (35° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	1
Time Tagged Commands (No.):	
Other Commands (No.):	5
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	6
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	1600
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	430.0
Test and Evaluation ($1000):	335.0
Unit Production ($1000):	349.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	12.0
Development Lead Time Variable (months):	8.3
Qualification Lead Time Constant (months):	8.0
Qualification Lead Time Variable (months):	1.6
State-of-Art Factor (N.D.):	1.0

Subsystem: DP (0305)

Configurations: All

Equipment Type: Tape Recorder (NASA/OSO)

Performance

Technical Characteristics

(1)	Capacity:	8.5×10^7 bits
(2)	Equivalent length:	549 m (1800 ft)
(3)	Density:	1575 bits/cm (4000 bits/in.)
(4)	Record rate:	4.1 cm/sec (1.6 in./sec)
(5)	Reproduce rate:	81 cm/sec (32 in./sec)
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	4.0
Maximum Power (watts):	11.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 7.03 (15.5 lb)

Volume (cc): 1.02×10^4 (0.359 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100° F)
Minimum (^oK):	275 (35° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	1
Time Tagged Commands (No.):	
Other Commands (No.):	5
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	6
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	1600
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	420.0
Test and Evaluation ($1000):	330.0
Unit Production ($1000):	341.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	12.0
Development Lead Time Variable (months):	8.3
Qualification Lead Time Constant (months):	8.0
Qualification Lead Time Variable (months):	1.6
State-of-Art Factor (N.D.):	1.0

Subsystem: DP (0306)

Configurations: All

Equipment Type: Tape Recorder (NASA/NIMBUS-E)

Performance

Technical Characteristics

(1)	Capacity:	2.1×10^7 bits
(2)	Equivalent length:	533 m (1750 ft)
(3)	Density:	1772 bits/cm (4500 bits/in.)
(4)	Record rate:	107 cm/sec (42 in./sec)
(5)	Reproduce rate:	107 cm/sec (42 in./sec)
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	14.5
Maximum Power (watts):	15.5
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 9.30 (20.5 lb)

Volume (cc): 1.28×10^4 (0.451 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100° F)
Minimum (^oK):	275 (35° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	1
Time Tagged Commands (No.):	
Other Commands (No.):	5
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	6
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	1600
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	508.0
Test and Evaluation ($1000):	385.0
Unit Production ($1000):	400.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	12.0
Development Lead Time Variable (months):	8.3
Qualification Lead Time Constant (months):	8.0
Qualification Lead Time Variable (months):	1.6
State-of-Art Factor (N.D.):	1.0

Subsystem: DP (0307)

Configurations: All

Equipment Type: Tape Recorder (AF/SESP-70-1)

Performance

Technical Characteristics

(1)	Capacity:	2.3×10^9 bits
(2)	Equivalent length:	594 m (1950 ft)
(3)	Density:	5591 bits/cm (14,200 bits/sec)
(4)	Record rate:	23 cm/sec (9.0 in./sec)
(5)	Reproduce rate:	137 cm/sec (54 in./sec)
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	20.0
Maximum Power (watts):	30.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 7.04 (15.5 lb)

Volume (cc): 9.51×10^3 (0.336 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100° F)
Minimum (^oK):	275 (35° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	1
Time Tagged Commands (No.):	
Other Commands (No.):	5
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	6
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	1600
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	420.0
Test and Evaluation ($1000):	330.0
Unit Production ($1000):	341.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	12.0
Development Lead Time Variable (months):	8.3
Qualification Lead Time Constant (months):	8.0
Qualification Lead Time Variable (months):	1.6
State-of-Art Factor (N.D.):	1.0

Subsystem: DP (0308)

Configurations: All

Equipment Type: Tape Recorder (AF/STP71-2 and 72-1)

Performance

Technical Characteristics

(1)	Capacity:	1.53×10^9 bits
(2)	Equivalent length:	625 m (2050 ft)
(3)	Density:	3465 bits/cm (8800 bits/in.)
(4)	Record rate:	19 cm/sec (7.3 in./sec)
(5)	Reproduce rate:	150 cm/sec (59 in./sec)
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	15.0
Maximum Power (watts):	25.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 7.04 (15.5 lb)

Volume (cc): 9.51×10^3 (0.336 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100° F)
Minimum (^oK):	275 (35° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	1
Time Tagged Commands (No.):	
Other Commands (No.):	5
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	6
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	1600
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	420.0
Test and Evaluation ($1000):	330.0
Unit Production ($1000):	341.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	12.0
Development Lead Time Variable (months):	8.3
Qualification Lead Time Constant (months):	8.0
Qualification Lead Time Variable (months):	1.6
State-of-Art Factor (N.D.):	1.0

Subsystem: DP (0309)

Configurations: All

Equipment Type: Tape Recorder (AF/STP72-2)

Performance

Technical Characteristics

(1)	Capacity:	1.53×10^9 bits
(2)	Equivalent length:	549 m (1800 ft)
(3)	Density:	5591 bits/cm (14,200 bits/in.)
(4)	Record rate:	5.72 cm/sec (2.25 in./sec)
(5)	Reproduce rate:	180 cm/sec (72 in/sec)
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	14.0
Maximum Power (watts):	30.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 7.62 (16.8 lb)

Volume (cc): 1.06×10^4 (0.376 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100° F)
Minimum (^oK):	275 (35° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	1
Time Tagged Commands (No.):	
Other Commands (No.):	5
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	6
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	1600
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	420.0
Test and Evaluation ($1000):	345.0
Unit Production ($1000):	357.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	12.0
Development Lead Time Variable (months):	8.3
Qualification Lead Time Constant (months):	8.0
Qualification Lead Time Variable (months):	1.6
State-of-Art Factor (N.D.):	1.0

Subsystem: DP (0310)

Configurations: All

Equipment Type: Tape Recorder (AF/S-3)

Performance

Technical Characteristics

(1)	Capacity:	2.0×10^8 bits
(2)	Equivalent length:	294 m (966 ft)
(3)	Density:	3504 bits/cm (8900 bits/in.)
(4)	Record rate:	4.67 cm/sec (1.84 in./sec)
(5)	Reproduce rate:	37.3 cm/sec (14.7 in./sec)
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	7.0
Maximum Power (watts):	14.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 6.58 (14.5 lb)

Volume (cc): 9.51×10^3 (0.336 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100° F)
Minimum (^oK):	275 (35° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	1
Time Tagged Commands (No.):	
Other Commands (No.):	5
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	6
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	1600
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	401.0
Test and Evaluation ($1000):	318.0
Unit Production ($1000):	330.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	12.0
Development Lead Time Variable (months):	8.3
Qualification Lead Time Constant (months):	8.0
Qualification Lead Time Variable (months):	1.6
State-of-Art Factor (N.D.):	1.0

Subsystem: DP (0311)

Configurations: All

Equipment Type: Tape Recorder (AF)

Performance

Technical Characteristics

(1)	Capacity:	1.7×10^9 bits
(2)	Equivalent length:	640 m (2100 ft)
(3)	Density:	3622 bits/cm (9200 bits/in.)
(4)	Record rate:	26.2 cm/sec (10.3 in./sec)
(5)	Reproduce rate:	105 cm/sec (41.2 in./sec)
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	8.0
Maximum Power (watts):	33.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 10.4 (23.0 lb)

Volume (cc): 1.36×10^4 (0.480 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100^o F)
Minimum (^oK):	275 (35^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	1
Time Tagged Commands (No.):	
Other Commands (No.):	5
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	6
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	1600
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	547.0
Test and Evaluation ($1000):	410.0
Unit Production ($1000):	420.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	12.0
Development Lead Time Variable (months):	8.3
Qualification Lead Time Constant (months):	8.0
Qualification Lead Time Variable (months):	1.6
State-of-Art Factor (N.D.):	1.0

Subsystem: CDPI (0401)

Configurations: Dual Spin

Equipment Type: Electrical Integration Assembly (includes converter)

Performance

Technical Characteristics

(1)

(2)

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts):	17.1
Maximum Power (watts):	24.0
Minimum Power (watts):	9.0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 9.07 (20.0 lb)

Volume (cc): 5.7×10^4 ($2.0\ ft^3$)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100^o F)
Minimum (^oK):	266 (20^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	3
Digital Points (No.):	1
Sample Rate (sec^{-1}):	1
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	5
Digital Points (No.):	6
Sample Rate (sec^{-1}):	0.0075
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	6500
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	507.0
Test and Evaluation ($1000):	409.0
Unit Production ($1000):	206.0
Reference Quantity (No.):	1
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	3.5
Development Lead Time Variable (months):	1.5
Qualification Lead Time Constant (months):	1.9
Qualification Lead Time Variable (months):	0.2
State-of-Art Factor (N.D.):	1.0

Subsystem: CDPI (0501)

Configurations: Dual Spin

Equipment Type: Switching Logic Assembly (includes converter)

Performance

Technical Characteristics

(1)

(2)

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts):	22.2
Maximum Power (watts):	30.0
Minimum Power (watts):	11.0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 5.44 (12.0 lb)

Volume (cc): 3.4×10^4 ($1.2\ ft^3$)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK): 311 (100^o F)

Minimum (^oK): 266 (20^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	1
Sample Rate (sec^{-1}):	1
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	6
Digital Points (No.):	2
Sample Rate (sec^{-1}):	0.0075
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	6500
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	(Included
Test and Evaluation ($1000):	in
Unit Production ($1000):	
Reference Quantity (No.):	CDPI
Factor (N.D.):	0401)

Schedule

Development Lead Time Constant (months):	3.5
Development Lead Time Variable (months):	1.5
Qualification Lead Time Constant (months):	1.9
Qualification Lead Time Variable (months):	0.2
State-of-Art Factor (N.D.):	1.0

Subsystem: CDPI (0601)

Configurations: All except Dual Spin

Equipment Type: Electrical Integration Assembly (includes converter)

Performance

Technical Characteristics

(1)

(2)

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts):	4.0
Maximum Power (watts):	6.0
Minimum Power (watts):	2.0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 8.71 (19.2 lb)

Volume (cc): 5.4×10^4 ($1.9\ ft^3$)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100^o F)
Minimum (^oK):	266 (20^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	6
Time Tagged Commands (No.):	
Other Commands (No.):	2
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	38
Digital Points (No.):	15
Sample Rate (sec^{-1}):	1
Word Length (bits):	4

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	6500
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	1963.0
Test and Evaluation ($1000):	469.0
Unit Production ($1000):	256.0
Reference Quantity (No.):	1
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	3.5
Development Lead Time Variable (months):	1.5
Qualification Lead Time Constant (months):	1.9
Qualification Lead Time Variable (months):	0.2
State-of-Art Factor (N.D.):	1.0

Subsystem: CDPI (0701)

Configurations: All except Dual Spin

Equipment Type: Auxiliary Integration Assembly (includes converter)

Performance

Technical Characteristics

(1)
(2)
(3)
(4)
(5)
(6)
(7)
(8)
(9)
(10)

Power

Average Power (watts):	5.8
Maximum Power (watts):	7.5
Minimum Power (watts):	3.0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 5.44 (12.0 lb)

Volume (cc): 3.62×10^3 ($0.128\ ft^3$)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100^o F)
Minimum (^oK):	266 (20^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	6
Time Tagged Commands (No.):	
Other Commands (No.):	2
High Rate Telemetry	
Analog Points (No.):	10
Digital Points (No.):	
Sample Rate (sec^{-1}):	125
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean (x $10^{\pm 9}$ hr):	6500
Standard Deviation (x 10^{+9} hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	(Included
Test and Evaluation ($1000):	in
Unit Production ($1000):	CDPI
Reference Quantity (No.):	
Factor (N.D.):	0601)

Schedule

Development Lead Time Constant (months):	3.5
Development Lead Time Variable (months):	1.5
Qualification Lead Time Constant (months):	1.9
Qualification Lead Time Variable (months):	0.2
State-of-Art Factor (N.D.):	1.0

Subsystem: Comm (0101)

Configurations: All except Separate Uplink and Downlink

Equipment Type: Baseband Assembly Unit

Performance

Technical Characteristics

(1)	Compatibility:	SGLS (1)
(2)	First data rate stream*:	128 kbps
(3)	Second data rate stream (Kbps):	NA
(4)	First subcarrier frequency*:	1.024 MHz
(5)	Second subcarrier frequency (Mhz):	NA
(6)	Transmitter requirement (T __):	NA
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	0.52
Maximum Power (watts):	0.52
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	C31(0701)

Weight (kg): 0.39 (0.85 lb)

Volume (cc): 280 (0.01 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	322 (120^o F)
Minimum (^oK):	264 (15^o F)

Pressure (kg/m^2):

*Second rate or frequency is the lower of the two if two are provided.

Performance (continued)

CDPI

Power Switching Commands (No.):	1
Time Tagged Commands (No.):	
Other Commands (No.):	1
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	1147
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	3

Cost

Design Engineering ($1000):	29.0
Test and Evaluation ($1000):	9.0
Unit Production ($1000):	16.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	7.3
Development Lead Time Variable (months):	3.1
Qualification Lead Time Constant (months):	1.8
Qualification Lead Time Variable (months):	0.2
State-of-Art Factor (N.D.):	1.0

Subsystem: Comm (0102)

Configurations: All except Separate Uplink and Downlink

Equipment Type: Baseband Assembly Unit

Performance

Technical Characteristics

(1)	Compatibility:	SGLS (1)
(2)	First data rate stream*:	128 kbps
(3)	Second data rate stream (Kbps):	NA
(4)	First subcarrier frequency*:	1.024 MHz
(5)	Second subcarrier frequency (Mhz):	NA
(6)	Transmitter requirement:	T01(0303)
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	(included in T01)
Maximum Power (watts):	
Minimum Power (watts):	
Nominal Voltage (volts):	
Maximum Voltage (volts):	
Minimum Voltage (volts):	
Converter/Inverter Requirement (flag):	

Weight (kg): (included in T01)

Volume (cc): (included in T01)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^{o}K):	333 (140^{o} F)
Minimum (^{o}K):	255 (0^{o} F)

Pressure (kg/m^{2}):

*Second rate or frequency is the lower of the two if two are provided.

Performance (continued)

CDPI

Power Switching Commands (No.):	1
Time Tagged Commands (No.):	
Other Commands (No.):	1
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean (x $10^{\pm 9}$ hr):	2000
Standard Deviation (x 10^{+9} hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	3

Cost

Design Engineering ($1000):	29.0
Test and Evaluation ($1000):	9.0
Unit Production ($1000):	16.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	7.3
Development Lead Time Variable (months):	3.1
Qualification Lead Time Constant (months):	1.8
Qualification Lead Time Variable (months):	0.2
State-of-Art Factor (N.D.):	1.0

Subsystem: Comm (0201)

Configurations: All

Equipment Type: Antenna

Performance

Technical Characteristics

(1)	Frequency, high band max.:	2300 MHz
(2)	Frequency, high band min.:	2200 MHz
(3)	Frequency, low band max.:	1850 MHz
(4)	Frequency, low band min.:	1750 MHz
(5)	Type and equipment number:	Biconical 21
(6)	On-axis gain:	2 dB
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 2.5 (5.6 lb)

Volume (cc): 1.6×10^5 (5.6 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK): 373 (212^o F)

Minimum (^oK): 218 (-67^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	100
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	2

Cost

Design Engineering ($1000):	180.0
Test and Evaluation ($1000):	153.0
Unit Production ($1000):	32.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	0
Development Lead Time Variable (months):	0
Qualification Lead Time Constant (months):	.0
Qualification Lead Time Variable (months):	0
State-of-Art Factor (N.D.):	1.0

Subsystem: Comm (0202)

Configurations: All

Equipment Type: Antenna

Performance

Technical Characteristics

(1)	Frequency, high band max.:	2300 MHz
(2)	Frequency, high band min.:	2200 MHz
(3)	Frequency, low band max. (Mhz):	NA
(4)	Frequency, low band min. (Mhz):	NA
(5)	Type and equipment number:	Parabola 1
(6)	On-axis gain:	20 dB
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 0.95 (2.1 lb)

Volume (cc): 5.9×10^4 (2.1 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	373 (212^o F)
Minimum (^oK):	218 (-67^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean (x $10^{\pm 9}$ hr):	40
Standard Deviation (x 10^{+9} hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	2

Cost

Design Engineering ($1000):	104.0
Test and Evaluation ($1000):	80.0
Unit Production ($1000):	11.5
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	0
Development Lead Time Variable (months):	0
Qualification Lead Time Constant (months):	0
Qualification Lead Time Variable (months):	0
State-of-Art Factor (N.D.):	1.0

Subsystem: Comm (0203)

Configurations: All

Equipment Type: Antenna

Performance

Technical Characteristics

(1)	Frequency, high band max.:	2300 MHz
(2)	Frequency, high band min.:	2200 MHz
(3)	Frequency, low band max.:	1850 MHz
(4)	Frequency, low band min.:	1750 MHz
(5)	Type and equipment number:	Omni 11
(6)	On-axis gain:	-9 dB
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 0.45 (1.0 lb)

Volume (cc): 2.8×10^4 ($1.0\ ft^3$)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	373 (212^o F)
Minimum (^oK):	218 (-67^o F)

Pressure (kg/m^2):

C.4

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	100
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	2

Cost

Design Engineering ($1000):	67.0
Test and Evaluation ($1000):	46.0
Unit Production ($1000):	12.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	0
Development Lead Time Variable (months):	0
Qualification Lead Time Constant (months):	0
Qualification Lead Time Variable (months):	0
State-of-Art Factor (N.D.):	1.0

Subsystem: Comm (0204)

Configurations: All

Equipment Type: Antenna

Performance

Technical Characteristics

(1)	Frequency, high band max. (Mhz):	
(2)	Frequency, high band min. (Mhz):	
(3)	Frequency, low band max. (Mhz):	
(4)	Frequency, low band min. (Mhz):	
(5)	Type and equipment number:	Monopole 51
(6)	On-axis gain:	2 dB
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 0.45 (1.0 lb)

Volume (cc): 2.8×10^4 ($1.0\ ft^3$)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK): 373 (212^o F)

Minimum (^oK): 218 (-67^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean (x $10^{\pm 9}$ hr):	100
Standard Deviation (x 10^{+9} hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	2

Cost

Design Engineering ($1000):	67.0
Test and Evaluation ($1000):	46.0
Unit Production ($1000):	12.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	0
Development Lead Time Variable (months):	0
Qualification Lead Time Constant (months):	0
Qualification Lead Time Variable (months):	0
State-of-Art Factor (N.D.):	1.0

Subsystem: Comm (0205)

Configurations: All

Equipment Type: Antenna

Performance

Technical Characteristics

(1)	Frequency, high band max. (Mhz):	
(2)	Frequency, high band min. (Mhz):	
(3)	Frequency, low band max. (Mhz):	
(4)	Frequency, low band min. (Mhz):	
(5)	Type and equipment number:	Conical spiral 41
(6)	On-axis gain:	-1 dB
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 0.45 (1.0 lb)

Volume (cc): 2.8×10^4 (1.0 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	373 (212^o F)
Minimum (^oK):	218 (-67^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	100
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	2

Cost

Design Engineering ($1000):	67.0
Test and Evaluation ($1000):	46.0
Unit Production ($1000):	12.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	0
Development Lead Time Variable (months):	0
Qualification Lead Time Constant (months):	0
Qualification Lead Time Variable (months):	0
State-of-Art Factor (N.D.):	1.0

Subsystem: Comm (0206)

Configurations: All

Equipment Type: Antenna

Performance

Technical Characteristics

(1)	Frequency, high band max. (Mhz):	
(2)	Frequency, high band min. (Mhz):	
(3)	Frequency, low band max. (Mhz):	
(4)	Frequency, low band min. (Mhz):	
(5)	Type and equipment number:	Helix 31
(6)	On-axis gain:	10 dB
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 0.45 (1.0 lb)

Volume (cc): 2.8×10^4 (1.0 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	373 (212^o F)
Minimum (^oK):	218 (-67^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	100
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	1.0
Total Redundant Elements (No.):	2

Cost

Design Engineering ($1000):	67.0
Test and Evaluation ($1000):	46.0
Unit Production ($1000):	12.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	0
Development Lead Time Variable (months):	0
Qualification Lead Time Constant (months):	0
Qualification Lead Time Variable (months):	0
State-of-Art Factor (N.D.):	1.0

Subsystem: Comm (0301)

Configurations: All

Equipment Type: Transmitter

Performance

Technical Characteristics

(1)	Special requirement code (T __):	NA
(2)	Compatibility:	SGLS (1)
(3)	Maximum frequency:	2300 MHz
(4)	Minimum frequency:	2200 MHz
(5)	Power output:	0.8 watts
(6)	Unified or nonunified*:	Unified (1)
(7)	First subcarrier frequency:	1.024 MHz
(8)	Second subcarrrier frequency (Mhz):	NA
(9)	Input data rate (Mbps):	NA
(10)	Modulation type:	Phase (1)

Power

Average Power (watts):	10.0
Maximum Power (watts):	15.0
Minimum Power (watts):	5.0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	C31 (701)

Weight (kg): 0.839 (1.85 lb)

Volume (cc): 5.4×10^3 (0.19 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	322 (120° F)
Minimum (^oK):	264 (15° F)

Pressure (kg/m^2):

*Nonunified requires (7) and (8) to be blank. Unified requires (9) to be blank.

Performance (continued)

CDPI	
Power Switching Commands (No.):	2
Time Tagged Commands (No.):	
Other Commands (No.):	12
High Rate Telemetry	
Analog Points (No.):	3
Digital Points (No.):	
Sample Rate (sec^{-1}):	125
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	6
Digital Points (No.):	2
Sample Rate (sec^{-1}):	1
Word Length (bits):	8
Safety	
Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean (x $10^{\pm 9}$ hr):	2836
Standard Deviation (x 10^{+9} hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	3
Cost	
Design Engineering ($1000):	50.0
Test and Evaluation ($1000):	50.0
Unit Production ($1000):	20.0
Reference Quantity (No.):	2
Factor (N.D.):	1
Schedule	
Development Lead Time Constant (months):	11.7
Development Lead Time Variable (months):	5.0
Qualification Lead Time Constant (months):	3.4
Qualification Lead Time Variable (months):	0.4
State-of-Art Factor (N.D.):	1.0

Subsystem: Comm (0302)

Configurations: All

Equipment Type: Transmitter

Performance

Technical Characteristics

(1)	Special requirement code (T _ _):	NA
(2)	Compatibility:	SGLS (1)
(3)	Maximum frequency:	2300 MHz
(4)	Minimum frequency:	2200 MHz
(5)	Power output:	1.6 watts
(6)	Unified or nonunified*:	Nonunified (0)
(7)	First subcarrier frequency (Mhz):	NA
(8)	Second subcarrier frequency (Mhz):	NA
(9)	Input data rate:	1.024 Mbps
(10)	Modulation type:	Phase (1)

Power

Average Power (watts):	16.0
Maximum Power (watts):	24.0
Minimum Power (watts):	8.0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	C31 (0701)

Weight (kg): 0.95 (2.1 lb)

Volume (cc): 5.9×10^4 (0.21 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100° F)
Minimum (^oK):	275 (35° F)

Pressure (kg/m^2):

*Nonunified requires (7) and (8) to be blank. Unified requires (9) to be blank.

Performance (continued)

CDPI

Power Switching Commands (No.):	2
Time Tagged Commands (No.):	
Other Commands (No.):	12
High Rate Telemetry	
Analog Points (No.):	3
Digital Points (No.):	
Sample Rate (sec^{-1}):	125
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	6
Digital Points (No.):	2
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	3022
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	3

Cost

Design Engineering ($1000):	231.0
Test and Evaluation ($1000):	84.4
Unit Production ($1000):	30.7
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	11.7
Development Lead Time Variable (months):	10.7
Qualification Lead Time Constant (months):	3.4
Qualification Lead Time Variable (months):	1.2
State-of-Art Factor (N.D.):	1.0

Subsystem: Comm (0303)

Configurations: All

Equipment Type: Transmitter

Performance

Technical Characteristics

(1)	Special requirement code:	T01 (0102)
(2)	Compatibility:	SGLS (1)
(3)	Maximum frequency:	2300 MHz
(4)	Minimum frequency:	2200 MHz
(5)	Power output:	2 watts
(6)	Unified or nonunified*:	Unified (1)
(7)	First subcarrier frequency:	1.024 MHz
(8)	Second subcarrier frequency (Mhz):	NA
(9)	Input data rate (Mbps):	NA
(10)	Modulation type:	Phase (1)

Power

Average Power (watts):	10.0
Maximum Power (watts):	15.0
Minimum Power (watts):	5.0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	36.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 1.1 (2.4 lb)

Volume (cc): 1.2×10^3 ($0.042\ ft^3$)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	333 (140° F)
Minimum (^oK):	255 (0° F)

Pressure (kg/m^2):

*Nonunified requires (7) and (8) to be blank. Unified requires (9) to be blank.

Performance (continued)

CDPI

Power Switching Commands (No.):	2
Time Tagged Commands (No.):	
Other Commands (No.):	14
High Rate Telemetry	
Analog Points (No.):	3
Digital Points (No.):	
Sample Rate (sec^{-1}):	125
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	6
Digital Points (No.):	2
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	14,000
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	3

Cost

Design Engineering ($1000):	27.0
Test and Evaluation ($1000):	33.0
Unit Production ($1000):	25.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	11.7
Development Lead Time Variable (months):	2.1
Qualification Lead Time Constant (months):	3.4
Qualification Lead Time Variable (months):	0.1
State-of-Art Factor (N.D.):	1.0

Subsystem: Comm (0304)

Configurations: All

Equipment Type: Transmitter

Performance

Technical Characteristics

(1)	Special requirement code (T __):	NA
(2)	Compatibility:	USB (2)
(3)	Maximum frequency (Mhz):	
(4)	Minimum frequency (Mhz):	
(5)	Power output:	5 watts
(6)	Unified or nonunified*:	Nonunified (0)
(7)	First subcarrier frequency (Mhz):	NA
(8)	Second subcarrier frequency (Mhz):	NA
(9)	Input data rate:	0.308 Mbps
(10)	Modulation type:	Frequency (2)

Power

Average Power (watts):	60.0
Maximum Power (watts):	90.0
Minimum Power (watts):	30.0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 0.4 (0.9 lb)

Volume (cc): 230 (0.0081 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK): 322 (120^o F)

Minimum (^oK): 261 (10^o F)

Pressure (kg/m^2):

*Nonunified requires (7) and (8) to be blank. Unified requires (9) to be blank.

Performance (continued)

CDPI

Power Switching Commands (No.):	2
Time Tagged Commands (No.):	
Other Commands (No.):	12
High Rate Telemetry	
Analog Points (No.):	3
Digital Points (No.):	
Sample Rate (sec^{-1}):	125
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	6
Digital Points (No.):	2
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	14,000
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	3

Cost

Design Engineering ($1000):	90.0
Test and Evaluation ($1000):	175.0
Unit Production ($1000):	31.0
Reference Quantity (No.):	4
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	11.7
Development Lead Time Variable (months):	9.6
Qualification Lead Time Constant (months):	3.4
Qualification Lead Time Variable (months):	1.0
State-of-Art Factor (N.D.):	1.0

Subsystem: Comm (0305)

Configurations: All

Equipment Type: Transmitter

Performance

Technical Characteristics

(1)	Special requirement code (T _ _):	NA
(2)	Compatibility:	SGLS (1)
(3)	Maximum frequency:	2300 MHz
(4)	Minimum frequency:	2200 MHz
(5)	Power output:	10 watts
(6)	Unified or non-unified*:	Unified (1)
(7)	First subcarrier frequency:	1.024 MHz
(8)	Second subcarrier frequency (Mhz):	NA
(9)	Input data rate (Mbps):	NA
(10)	Modulation type:	Phase (1)

Power

Average Power (watts):	40.0
Maximum Power (watts):	50.0
Minimum Power (watts):	20.0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 1.1 (2.5 lb)

Volume (cc): 570 (0.020 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	322 (120^o F)
Minimum (^oK):	264 (15^o F)

Pressure (kg/m^2):

*Nonunified requires (7) and (8) to be blank. Unified requires (9) to be blank.

Performance (continued)

CDPI

Power Switching Commands (No.):	2
Time Tagged Commands (No.):	
Other Commands (No.):	12
High Rate Telemetry	
Analog Points (No.):	3
Digital Points (No.):	
Sample Rate (sec^{-1}):	125
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	6
Digital Points (No.):	2
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($x \cdot 10^{\pm 9}$ hr):	14,000
Standard Deviation ($x\ 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	3

Cost

Design Engineering ($1000):	100.0
Test and Evaluation ($1000):	100.0
Unit Production ($1000):	25.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	11.7
Development Lead Time Variable (months):	7.9
Qualification Lead Time Constant (months):	3.4
Qualification Lead Time Variable (months):	0.8
State-of-Art Factor (N.D.):	1.0

Subsystem: Comm (0306)

Configurations: All

Equipment Type: Transmitter

Performance

Technical Characteristics

(1)	Special requirement code (T _ _):	NA
(2)	Compatibility:	SGLS (1)
(3)	Maximum frequency:	2300 MHz
(4)	Minimum frequency:	2200 MHz
(5)	Power output:	20 watts
(6)	Unified or nonunified*:	Unified (1)
(7)	First subcarrier frequency:	1.024 MHz
(8)	Second subcarrier frequency (Mhz):	NA
(9)	Input data rate (Mbps):	NA
(10)	Modulation type:	Phase (1)

Power

Average Power (watts):	90.0
Maximum Power (watts):	110.0
Minimum Power (watts):	50.0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 1.25 (2.75 lb)

Volume (cc): 570 (0.020 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	322 (120^o F)
Minimum (^oK):	264 (15^o F)

Pressure (kg/m^2):

*Nonunified requires (7) and (8) to be blank. Unified requires (9) to be blank.

Performance (continued)

CDPI	
Power Switching Commands (No.):	2
Time Tagged Commands (No.):	
Other Commands (No.):	12
High Rate Telemetry	
Analog Points (No.):	3
Digital Points (No.):	
Sample Rate (sec^{-1}):	125
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	6
Digital Points (No.):	2
Sample Rate (sec^{-1}):	1
Word Length (bits):	8
Safety	
Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	14,000
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	3
Cost	
Design Engineering ($1000):	110.0
Test and Evaluation ($1000):	110.0
Unit Production ($1000):	27.5
Reference Quantity (No.):	2
Factor (N.D.):	1
Schedule	
Development Lead Time Constant (months):	11.7
Development Lead Time Variable (months):	8.5
Qualification Lead Time Constant (months):	3.4
Qualification Lead Time Variable (months):	0.8
State-of-Art Factor (N.D.):	1.0

Subsystem: Comm (0307)

Configurations: All

Equipment Type: Transmitter

Performance

Technical Characteristics

(1)	Special requirement code (T _ _):	NA
(2)	Compatibility:	SGLS (1)
(3)	Maximum frequency:	2300 MHz
(4)	Minimum frequency:	2200 MHz
(5)	Power output:	5 watts
(6)	Unified or nonunified*:	Unified (1)
(7)	First subcarrier frequency:	1.024 MHz
(8)	Second subcarrier frequency (Mhz):	NA
(9)	Input data rate (Mbps):	NA
(10)	Modulation type:	Phase (1)

Power

Average Power (watts):	20.0
Maximum Power (watts):	26.0
Minimum Power (watts):	10.0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 1.02 (2.25 lb)

Volume (cc): 570 (0.020 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK): 322 (120^o F)

Minimum (^oK): 264 (15^o F)

Pressure (kg/m^2):

*Nonunified requires (7) and (8) to be blank. Unified requires (9) to be blank.

Performance (continued)

CDPI

Power Switching Commands (No.):	2
Time Tagged Commands (No.):	
Other Commands (No.):	12
High Rate Telemetry	
Analog Points (No.):	3
Digital Points (No.):	
Sample Rate (sec^{-1}):	125
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	6
Digital Points (No.):	2
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	14,000
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	3

Cost

Design Engineering ($1000):	90.0
Test and Evaluation ($1000):	80.0
Unit Production ($1000):	22.5
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	11.7
Development Lead Time Variable (months):	7.1
Qualification Lead Time Constant (months):	3.4
Qualification Lead Time Variable (months):	0.6
State-of-Art Factor (N.D.):	1.0

Subsystem: Comm (0401)

Configurations: All

Equipment Type: Receiver

Performance

Technical Characteristics

(1)	Compatibility, range and range rate:	SGLS (1)
(2)	Maximum frequency:	1850 MHz
(3)	Minimum frequency:	1750 MHz
(4)	Modulation type:	Phase (1)
(5)	Maximum command rate (baud or bps):	1000
(6)	Command output type:	Ternary FSK (3)
(7)	F_1:	65 kHz
(8)	F_2:	76 kHz
(9)	F_3:	95 kHz
(10)	Signal conditioner requirement (SC __):	NA

Power

Average Power (watts):	3.0
Maximum Power (watts):	4.0
Minimum Power (watts):	1.0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	C30 (702)

Weight (kg): 1.8 (4.0 lb)

Volume (cc): 1.1×10^4 (0.4 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	322 (120^o F)
Minimum (^oK):	264 (15^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	2
Time Tagged Commands (No.):	
Other Commands (No.):	2
High Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	7
Sample Rate (sec^{-1}):	125
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	1
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	4206
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	3

Cost

Design Engineering ($1000):	76.0
Test and Evaluation ($1000):	171.0
Unit Production ($1000):	35.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	4.2
Development Lead Time Variable (months):	4.3
Qualification Lead Time Constant (months):	7.1
Qualification Lead Time Variable (months):	2.9
State-of-Art Factor (N.D.):	1.0

Subsystem: Comm (0402)

Configurations: All

Equipment Type: Receiver

Performance

Technical Characteristics

(1)	Compatibility, range and range rate:	SGLS (1)
(2)	Maximum frequency:	1850 MHz
(3)	Minimum frequency:	1750 MHz
(4)	Modulation type:	Phase (1)
(5)	Maximum command rate (baud or bps):	1000
(6)	Command output type:	Ternary FSK (3)
(7)	F_1:	65 kHz
(8)	F_2:	76 kHz
(9)	F_3:	95 kHz
(10)	Signal conditioner requirement:	SC01 (0501)

Power

Average Power (watts):	3.25
Maximum Power (watts):	5.0
Minimum Power (watts):	1.1
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	36.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 1.6 (3.6 lb)

Volume (cc): 1.2×10^3 ($0.042\ ft^3$)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	333 (140^o F)
Minimum (^oK):	255 (0^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	1
Time Tagged Commands (No.):	
Other Commands (No.):	2
High Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	7
Sample Rate (sec^{-1}):	125
Word Length (bits):	8
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	1
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	3000
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	3

Cost

Design Engineering ($1000):	72.0
Test and Evaluation ($1000):	160.0
Unit Production ($1000):	34.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	4.2
Development Lead Time Variable (months):	3.8
Qualification Lead Time Constant (months):	7.1
Qualification Lead Time Variable (months):	2.5
State-of-Art Factor (N.D.):	1.0

Subsystem: Comm (0501)

Configurations: All

Equipment Type: Command Signal Conditioner

Performance

Technical Characteristics

(1)	Compatibility:	SGLS (1)
(2)	Special requirement code:	SC01 (0402)
(3)	Command input:	Ternary FSK (3)
(4)	F_1:	65 kHz
(5)	F_2:	76 kHz
(6)	F_3:	95 kHz
(7)	Maximum command rate:	1000 baud
(8)		
(9)		
(10)		

Power

Average Power (watts):	(included in receiver)
Maximum Power (watts):	
Minimum Power (watts):	
Nominal Voltage (volts):	
Maximum Voltage (volts):	
Minimum Voltage (volts):	
Converter/Inverter Requirement (flag):	

Weight (kg): (included in receiver)

Volume (cc): (included in receiver)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^{o}K):	333 (140^{o} F)
Minimum (^{o}K):	255 (0^{o} F)

Pressure (kg/m^2):

Performance (continued)

- CDPI
  - Power Switching Commands (No.): 1
  - Time Tagged Commands (No.):
  - Other Commands (No.): 2
  - High Rate Telemetry
    - Analog Points (No.):
    - Digital Points (No.):
    - Sample Rate (sec^{-1}):
    - Word Length (bits):
  - Low Rate Telemetry
    - Analog Points (No.):
    - Digital Points (No.): 1
    - Sample Rate (sec^{-1}): 1
    - Word Length (bits): 8

Safety

- Failure Model (flag): 1
- Failure Parameters
  - Failure Rate or Mean ($x\ 10^{\pm 9}$ hr): 3000
  - Standard Deviation ($x\ 10^{+9}$ hr):
  - Dormancy Factor (N.D.): 0.5
- Total Redundant Elements (No.): 3

Cost

- Design Engineering ($1000): 36.0
- Test and Evaluation ($1000): 27.0
- Unit Production ($1000): 25.0
- Reference Quantity (No.): 2
- Factor (N.D.): 1

Schedule

- Development Lead Time Constant (months): 7.3
- Development Lead Time Variable (months): 3.1
- Qualification Lead Time Constant (months): 1.8
- Qualification Lead Time Variable (months): 0.2
- State-of-Art Factor (N.D.): 1.0

Subsystem: Comm (0502)

Configurations: All

Equipment Type: Command Signal Conditioner

Performance

Technical Characteristics

(1)	Compatibility:	SGLS (1)
(2)	Special requirement code (SC __):	NA
(3)	Command input:	Ternary FSK (3)
(4)	F_1:	65 kHz
(5)	F_2:	76 kHz
(6)	F_3:	95 kHz
(7)	Maximum command rate:	1000 baud
(8)		
(9)		
(10)		

Power

Average Power (watts):	1.0
Maximum Power (watts):	1.0
Minimum Power (watts):	0.5
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	C30 (0702)

Weight (kg): 0.612 (1.35 lb)

Volume (cc): 4.0×10^3 ($0.14\ ft^3$)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	322 (120^o F)
Minimum (^oK):	264 (15^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	1
Time Tagged Commands (No.):	
Other Commands (No.):	2
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	1
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	2296
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	3

Cost

Design Engineering ($1000):	36.0
Test and Evaluation ($1000):	27.0
Unit Production ($1000):	25.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	7.3
Development Lead Time Variable (months):	3.1
Qualification Lead Time Constant (months):	1.8
Qualification Lead Time Variable (months):	0.2
State-of-Art Factor (N.D.):	1.0

Subsystem: Comm (0601)

Configurations: Configurations Having Common Antenna

Equipment Type: Diplexer

Performance

Technical Characteristics

(1)	Compatibility:	SGLS (1)
(2)	Max. receive frequency:	1850 MHz
(3)	Min. receive frequency:	1750 MHz
(4)	Max. transmit frequency:	2300 MHz
(5)	Min. transmit frequency:	2200 MHz
(6)	Max. allowable transmit power:	7 watts
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	1.0
Maximum Power (watts):	1.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 0.34 (0.75 lb)

Volume (cc): 510 (0.018 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK): 344 (160^o F)

Minimum (^oK): 239 (-30^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	1
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	1
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	130
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	2

Cost

Design Engineering ($1000):	10.0
Test and Evaluation ($1000):	6.0
Unit Production ($1000):	7.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	4.2
Development Lead Time Variable (months):	1.6
Qualification Lead Time Constant (months):	0.9
Qualification Lead Time Variable (months):	0.1
State-of-Art Factor (N.D.):	1.0

Subsystem: Comm (0602)

Configurations: Configurations Having Common Antenna

Equipment Type: Diplexer

Performance

Technical Characteristics

(1)	Compatibility:	SGLS (1)
(2)	Max. receive frequency:	1850 MHz
(3)	Min. receive frequency:	1750 MHz
(4)	Max. transmit frequency:	2300 MHz
(5)	Min. transmit frequency:	2200 MHz
(6)	Max. allowable transmit power:	20 watts
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	1.0
Maximum Power (watts):	1.0
Minimum Power (watts):	0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 0.82 (1.8 lb)

Volume (cc): 990 (0.035 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	344 (160^o F)
Minimum (^oK):	239 (-30^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	1
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	1
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	130
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	2

Cost

Design Engineering ($1000):	14.2
Test and Evaluation ($1000):	10.0
Unit Production ($1000):	11.2
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	4.2
Development Lead Time Variable (months):	2.0
Qualification Lead Time Constant (months):	0.9
Qualification Lead Time Variable (months):	0.1
State-of-Art Factor (N.D.):	1.0

Subsystem: Comm (0701)

Configurations: All

Equipment Type: Power Converter (Transmitter)

Performance

Technical Characteristics

(1)	Special requirement code:	C31 (0701)
(2)		
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	13.5
Maximum Power (watts):	20.0
Minimum Power (watts):	10.0
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg):	0.794 (1.75 lb)
Volume (cc):	5.1×10^3 (0.18 ft^3)

Vibration

Random (g, rms):	
Non-Random (g):	

Temperature

Maximum (^oK):	322 (120° F)
Minimum (^oK):	264 (15° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	1
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	1
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	872
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	3

Cost

Design Engineering ($1000):	0	CER
Test and Evaluation ($1000):	0	
Unit Production ($1000):	0	
Reference Quantity (No.):	1	
Factor (N.D.):	1	

Schedule

Development Lead Time Constant (months):	7.4
Development Lead Time Variable (months):	3.2
Qualification Lead Time Constant (months):	2.5
Qualification Lead Time Variable (months):	0.3
State-of-Art Factor (N.D.):	1.0

Subsystem: Comm (0702)

Configurations: All

Equipment Type: Power Converter (Receiver)

Performance

Technical Characteristics

(1) Special requirement code: C30 (0702)

(2)

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts):	7.63
Maximum Power (watts):	10.0
Minimum Power (watts):	3.8
Nominal Voltage (volts):	28.0
Maximum Voltage (volts):	32.0
Minimum Voltage (volts):	24.0
Converter/Inverter Requirement (flag):	

Weight (kg): 0.794 (1.75 lb)

Volume (cc): 5.1×10^3 ($0.18\ ft^3$)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	322 (120^o F)
Minimum (^oK):	264 (15^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	1
Time Tagged Commands (No.):	
Other Commands (No.):	

High Rate Telemetry

Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	

Low Rate Telemetry

Analog Points (No.):	1
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1

Failure Parameters

Failure Rate or Mean (x $10^{\pm 9}$ hr):	882
Standard Deviation (x 10^{+9} hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	3

Cost

Design Engineering ($1000):	0	CER
Test and Evaluation ($1000):	0	
Unit Production ($1000):	0	
Reference Quantity (No.):	1	
Factor (N.D.):	1	

Schedule

Development Lead Time Constant (months):	7.4
Development Lead Time Variable (months):	3.2
Qualification Lead Time Constant (months):	2.5
Qualification Lead Time Variable (months):	0.3
State-of-Art Factor (N.D.):	1.0

Subsystem: EP (0101)

Configurations: Shunt & Shunt and Discharge Regulation

Equipment Type: Shunt Regulator

Performance

Technical Characteristics

(1) Maximum power capacity: 62.6 watt

(2)

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 1.9 (4.2 lb)

Volume (cc): 2.8×10^4 (1.0 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	373 (212^o F)
Minimum (^oK):	218 (-67^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	1
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	3
Digital Points (No.):	1
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean (x $10^{\pm 9}$ hr):	200
Standard Deviation (x 10^{+9} hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	80.0
Test and Evaluation ($1000):	40.0
Unit Production ($1000):	7.0
Reference Quantity (No.):	4
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	9.5
Development Lead Time Variable (months):	7.4
Qualification Lead Time Constant (months):	2.3
Qualification Lead Time Variable (months):	0.6
State-of-Art Factor (N.D.):	1.0

Subsystem: EP (0102)

Configurations: Shunt & Shunt and Discharge Regulation

Equipment Type: Shunt Regulator

Performance

Technical Characteristics

(1) Maximum power capacity: 62.0 watts

(2)

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 2.0 (4.4 lb)

Volume (cc): 1.2×10^4 (0.44 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	373 (212^o F)
Minimum (^oK):	218 (-67^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	1
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	3
Digital Points (No.):	1
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	200
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	80.0
Test and Evaluation ($1000):	40.0
Unit Production ($1000):	7.0
Reference Quantity (No.):	4
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	9.5
Development Lead Time Variable (months):	3.6
Qualification Lead Time Constant (months):	2.3
Qualification Lead Time Variable (months):	0.2
State-of-Art Factor (N.D.):	1.0

Subsystem: EP (0201)

Configurations: All

Equipment Type: Battery cell

Performance

Technical Characteristics

(1)	Capacity:	3.0 amp-hr
(2)	Watt/hour charge efficiency (N.D.):	0.65
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 0.14 (0.30 lb)

Volume (cc): 66.3 (0.00234 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	300 (80.6^o F)
Minimum (^oK):	277 (39.2^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	3
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	3
Failure Parameters	
Failure Rate or Mean (x $10^{\pm 9}$ hr):	NA
Standard Deviation (x 10^{+9} hr):	
Dormancy Factor (N.D.):	
Total Redundant Elements (No.):	6

Cost

Design Engineering ($1000):	51.0
Test and Evaluation ($1000):	59.0
Unit Production ($1000):	24.5
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	6.9
Development Lead Time Variable (months):	1.0
Qualification Lead Time Constant (months):	2.1
Qualification Lead Time Variable (months):	0.1
State-of-Art Factor (N.D.):	1.0

Subsystem: EP (0202)

Configurations: All

Equipment Type: Battery cell

Performance

Technical Characteristics

(1)	Capacity:	4.0 amp-hr
(2)	Watt/hour charge efficiency (N.D.):	0.65
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 0.15 (0.34 lb)

Volume (cc): 68.8 (0.00243 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	300 (80.6^oF)
Minimum (^oK):	277 (39.2^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):	3
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	3
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	NA
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	
Total Redundant Elements (No.):	6

Cost

Design Engineering ($1000):	55.0
Test and Evaluation ($1000):	62.0
Unit Production ($1000):	26.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	6.9
Development Lead Time Variable (months):	1.1
Qualification Lead Time Constant (months):	2.1
Qualification Lead Time Variable (months):	0.1
State-of-Art Factor (N.D.):	1.0

Subsystem: EP (0203)

Configurations: All

Equipment Type: Battery cell

Performance

Technical Characteristics

(1)	Capacity:	6.5 amp-hr
(2)	Watt/hour charge efficiency (N.D.):	0.65
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 0.27 (0.60 lb)

Volume (cc): 110 (0.0040 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	300 (80.6^o F)
Minimum (^oK):	277 (39.2^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.):	3
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	3
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	NA
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	
Total Redundant Elements (No.):	6

Cost

Design Engineering ($1000):	64.0
Test and Evaluation ($1000):	82.0
Unit Production ($1000):	32.5
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	6.9
Development Lead Time Variable (months):	1.4
Qualification Lead Time Constant (months):	2.1
Qualification Lead Time Variable (months):	0.1
State-of-Art Factor (N.D.):	1.0

Subsystem: EP (0204)

Configurations: All

Equipment Type: Battery cell

Performance

Technical Characteristics

(1)	Capacity:	7.0 amp-hr
(2)	Watt/hour charge efficiency (N.D.):	0.65
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 0.28 (0.62 lb)

Volume (cc): 105 (0.00372 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	300 (80.6^o F)
Minimum (^oK):	277 (39.2^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	3
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	3
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	NA
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	
Total Redundant Elements (No.):	6

Cost

Design Engineering ($1000):	65.0
Test and Evaluation ($1000):	82.5
Unit Production ($1000):	32.5
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	6.9
Development Lead Time Variable (months):	1.4
Qualification Lead Time Constant (months):	2.1
Qualification Lead Time Variable (months):	0.1
State-of-Art Factor (N.D.):	1.0

Subsystem: EP (0205)

Configurations: All

Equipment Type: Battery cell

Performance

Technical Characteristics

(1)	Capacity:	10.0 amp-hr
(2)	Watt/hour charge efficiency (N.D.):	0.65
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 0.32 (0.70 lb)

Volume (cc): 127 (0.00449 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	300 (80.6^o F)
Minimum (^oK):	277 (39.2^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	3
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	3
Failure Parameters	
Failure Rate or Mean (x $10^{\pm 9}$ hr):	NA
Standard Deviation (x 10^{+9} hr):	
Dormancy Factor (N.D.):	
Total Redundant Elements (No.):	6

Cost

Design Engineering ($1000):	241.0
Test and Evaluation ($1000):	88.0
Unit Production ($1000):	34.5
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	6.9
Development Lead Time Variable (months):	1.5
Qualification Lead Time Constant (months):	2.1
Qualification Lead Time Variable (months):	0.1
State-of-Art Factor (N.D.):	1.0

Subsystem: EP (0206)

Configurations: All

Equipment Type: Battery cell

Performance

Technical Characteristics

(1)	Capacity:	11.0 amp-hr
(2)	Watt/hour charge efficiency (N.D.):	0.65
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 0.38 (0.83 lb)

Volume (cc): 143 (0.00506 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK): 300 (80.6° F)

Minimum (^oK): 277 (39.2° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	3
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	3
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	NA
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	
Total Redundant Elements (No.):	6

Cost

Design Engineering ($1000):	255.0
Test and Evaluation ($1000):	95.0
Unit Production ($1000):	37.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	6.9
Development Lead Time Variable (months):	1.7
Qualification Lead Time Constant (months):	2.1
Qualification Lead Time Variable (months):	0.1
State-of-Art Factor (N.D.):	1.0

Subsystem: EP (0207)

Configurations: All

Equipment Type: Battery cell

Performance

Technical Characteristics

(1)	Capacity:	12.0 amp-hr
(2)	Watt/hour charge efficiency (N.D.):	0.65
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 0.454 (10.0 lb)

Volume (cc): 180 (0.00637 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	300 (80.6^o F)
Minimum (^oK):	277 (39.2^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):

Time Tagged Commands (No.):

Other Commands (No.):

High Rate Telemetry

Analog Points (No.):

Digital Points (No.):

Sample Rate (sec^{-1}):

Word Length (bits):

Low Rate Telemetry

Analog Points (No.): 3

Digital Points (No.):

Sample Rate (sec^{-1}): 1

Word Length (bits): 8

Safety

Failure Model (flag): 3

Failure Parameters

Failure Rate or Mean ($x\ 10^{\pm 9}$ hr): NA

Standard Deviation ($x\ 10^{+9}$ hr):

Dormancy Factor (N.D.):

Total Redundant Elements (No.): 6

Cost

Design Engineering ($1000): 270.0

Test and Evaluation ($1000): 102.0

Unit Production ($1000): 39.5

Reference Quantity (No.): 2

Factor (N.D.): 1

Schedule

Development Lead Time Constant (months): 6.9

Development Lead Time Variable (months): 1.8

Qualification Lead Time Constant (months): 2.1

Qualification Lead Time Variable (months): 0.1

State-of-Art Factor (N.D.): 1.0

Subsystem: EP (0208)

Configurations: All

Equipment Type: Battery cell

Performance

Technical Characteristics

(1)	Capacity:	14.0 amp-hr
(2)	Watt/hour charge efficiency (N.D.):	0.65
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 0.522 (1.15 lb)

Volume (cc): 208 (0.00734 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	300 (80.6° F)
Minimum (^oK):	277 (39.2° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	3
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	3
Failure Parameters	
Failure Rate or Mean (x $10^{\pm 9}$ hr):	NA
Standard Deviation (x 10^{+9} hr):	
Dormancy Factor (N.D.):	
Total Redundant Elements (No.):	6

Cost

Design Engineering ($1000):	295.0
Test and Evaluation ($1000):	111.0
Unit Production ($1000):	42.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	6.9
Development Lead Time Variable (months):	2.0
Qualification Lead Time Constant (months):	2.1
Qualification Lead Time Variable (months):	0.1
State-of-Art Factor (N.D.):	1.0

Subsystem: EP (0209)

Configurations: All

Equipment Type: Battery cell

Performance

Technical Characteristics

(1)	Capacity:	17.0 amp-hr
(2)	Watt/hour charge efficiency (N.D.):	0.65
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 0.612 (1.35 lb)

Volume (cc): 216 (0.00763 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	300 (80.6^o F)
Minimum (^oK):	277 (39.2^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	3
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	3
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	NA
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	
Total Redundant Elements (No.):	6

Cost

Design Engineering ($1000):	330.0
Test and Evaluation ($1000):	120.0
Unit Production ($1000):	44.8
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	6.9
Development Lead Time Variable (months):	2.1
Qualification Lead Time Constant (months):	2.1
Qualification Lead Time Variable (months):	0.1
State-of-Art Factor (N.D.):	1.0

Subsystem: EP (0210)

Configurations: All

Equipment Type: Battery cell

Performance

Technical Characteristics

(1)	Capacity:	18.0 amp-hr
(2)	Watt/hour charge efficiency (N.D.):	0.65
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 0.721 (1.59 lb)

Volume (cc): 442 (0.0156 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	300 (80.6^o F)
Minimum (^oK):	277 (39.2^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	3
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	3
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	NA
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	
Total Redundant Elements (No.):	6

Cost

Design Engineering ($1000):	340.0
Test and Evaluation ($1000):	129.0
Unit Production ($1000):	47.6
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	6.9
Development Lead Time Variable (months):	2.3
Qualification Lead Time Constant (months):	2.1
Qualification Lead Time Variable (months):	0.2
State-of-Art Factor (N.D.):	1.0

Subsystem: EP (0211)

Configurations: All

Equipment Type: Battery cell

Performance

Technical Characteristics

(1)	Capacity:	26.0 amp-hr
(2)	Watt/hour charge efficiency (N.D.):	0.65
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 0.91 (2.0 lb)

Volume (cc): 306 (0.0108 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	300 (80.6^o F)
Minimum (^oK):	277 (39.2^o F)

Pressure (kg/m^2):

Performance (continued)	
CDPI	
Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	3
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8
Safety	
Failure Model (flag):	3
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	NA
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	
Total Redundant Elements (No.):	6
Cost	
Design Engineering ($1000):	421.0
Test and Evaluation ($1000):	143.0
Unit Production ($1000):	52.2
Reference Quantity (No.):	2
Factor (N.D.):	1
Schedule	
Development Lead Time Constant (months):	6.9
Development Lead Time Variable (months):	2.6
Qualification Lead Time Constant (months):	2.1
Qualification Lead Time Variable (months):	0.2
State-of-Art Factor (N.D.):	1.0

Subsystem: EP (0212)

Configurations: All

Equipment Type: Battery cell

Performance

Technical Characteristics

(1)	Capacity:	26.0 amp-hr
(2)	Watt/hour charge efficiency (N.D.):	0.65
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 0.91 (2.0 lb)

Volume (cc): 340 (0.0120 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK): 300 (80.6° F)

Minimum (^oK): 277 (39.2° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	3
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	3
Failure Parameters	
Failure Rate or Mean ($x\ 10^{\pm 9}$ hr):	NA
Standard Deviation ($x\ 10^{+9}$ hr):	
Dormancy Factor (N.D.):	
Total Redundant Elements (No.):	6

Cost

Design Engineering ($1000):	421.0
Test and Evaluation ($1000):	143.0
Unit Production ($1000):	52.2
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	6.9
Development Lead Time Variable (months):	2.6
Qualification Lead Time Constant (months):	2.1
Qualification Lead Time Variable (months):	0.2
State-of-Art Factor (N.D.):	1.0

Subsystem: EP (0213)

Configurations: All

Equipment Type: Battery cell

Performance

Technical Characteristics

(1)	Capacity:	28.0 amp-hr
(2)	Watt/hour charge efficiency (N.D.):	0.65
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 1.0 (2.3 lb)

Volume (cc): 413 (0.0146 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	300 (80.6^o F)
Minimum (^oK):	277 (39.2^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	3
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	3
Failure Parameters	
Failure Rate or Mean (x $10^{\pm 9}$ hr):	NA
Standard Deviation (x 10^{+9} hr):	
Dormancy Factor (N.D.):	
Total Redundant Elements (No.):	6

Cost

Design Engineering ($1000):	440.0
Test and Evaluation ($1000):	151.0
Unit Production ($1000):	55.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	6.9
Development Lead Time Variable (months):	2.8
Qualification Lead Time Constant (months):	2.1
Qualification Lead Time Variable (months):	0.2
State-of-Art Factor (N.D.):	1.0

Subsystem: EP (0214)

Configurations: All

Equipment Type: Battery cell

Performance

Technical Characteristics

(1)	Capacity:	33.0 amp-hr
(2)	Watt/hour charge efficiency (N.D.):	0.65
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 1.1 (2.4 lb)

Volume (cc): 326 (0.0115 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	300 (80.6° F)
Minimum (^oK):	277 (39.2° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	3
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	3
Failure Parameters	
Failure Rate or Mean (x $10^{\pm 9}$ hr):	NA
Standard Deviation (x 10^{+9} hr):	
Dormancy Factor (N.D.):	
Total Redundant Elements (No.):	6

Cost

Design Engineering ($1000):	485.0
Test and Evaluation ($1000):	155.0
Unit Production ($1000):	56.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	6.9
Development Lead Time Variable (months):	2.9
Qualification Lead Time Constant (months):	2.1
Qualification Lead Time Variable (months):	0.2
State-of-Art Factor (N.D.):	1.0

Subsystem: EP (0215)

Configurations: All

Equipment Type: Battery cell

Performance

Technical Characteristics

(1)	Capacity:	40.0 amp-hr
(2)	Watt/hour charge efficiency (N.D.):	0.65
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 1.3 (2.8 lb)

Volume (cc): 487 (0.0172 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	300 (80.6° F)
Minimum (^oK):	277 (39.2° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	3
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	3
Failure Parameters	
Failure Rate or Mean (x $10^{\pm 9}$ hr):	NA
Standard Deviation (x 10^{+9} hr):	
Dormancy Factor (N.D.):	
Total Redundant Elements (No.):	6

Cost

Design Engineering ($1000):	542.0
Test and Evaluation ($1000):	167.0
Unit Production ($1000):	60.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	6.9
Development Lead Time Variable (months):	3.0
Qualification Lead Time Constant (months):	2.1
Qualification Lead Time Variable (months):	0.2
State-of-Art Factor (N.D.):	1.0

Subsystem: EP (0216)

Configurations: All

Equipment Type: Battery cell

Performance

Technical Characteristics

(1)	Capacity:	50.0 amp-hr
(2)	Watt/hour charge efficiency (N.D.):	0.65
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 1.6 (3.6 lb)

Volume (cc): 590 (0.0207 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	300 (80.6^o F)
Minimum (^oK):	277 (39.2^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	3
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	3
Failure Parameters	
Failure Rate or Mean (x $10^{\pm 9}$ hr):	NA
Standard Deviation (x 10^{+9} hr):	
Dormancy Factor (N.D.):	
Total Redundant Elements (No.):	6

Cost

Design Engineering ($1000):	620.0
Test and Evaluation ($1000):	188.0
Unit Production ($1000):	66.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	6.9
Development Lead Time Variable (months):	3.5
Qualification Lead Time Constant (months):	2.1
Qualification Lead Time Variable (months):	0.3
State-of-Art Factor (N.D.):	1.0

Subsystem: EP (0217)

Configurations: All

Equipment Type: Battery cell

Performance

Technical Characteristics.

(1)	Capacity:	60.0 amp-hr
(2)	Watt/hour charge efficiency (N.D.):	0.65
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 1.8 (4.0 lb)

Volume (cc): 650 (0.0230 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	300 (80.6^o F)
Minimum (^oK):	277 (39.2^o F)

Pressure (kg/m^2):

Performance (continued)	
CDPI	
Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	3
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8
Safety	
Failure Model (flag):	3
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	NA
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	
Total Redundant Elements (No.):	6
Cost	
Design Engineering ($1000):	685.0
Test and Evaluation ($1000):	196.0
Unit Production ($1000):	69.0
Reference Quantity (No.):	2
Factor (N.D.):	1
Schedule	
Development Lead Time Constant (months):	6.9
Development Lead Time Variable (months):	3.7
Qualification Lead Time Constant (months):	2.1
Qualification Lead Time Variable (months):	0.3
State-of-Art Factor (N.D.):	1.0

Subsystem: EP (0218)

Configurations: All

Equipment Type: Battery cell

Performance

Technical Characteristics

(1)	Capacity:	65.0 amp-hr
(2)	Watt/hour charge efficiency (N.D.):	0.65
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 2.0 (4.5 lb)

Volume (cc): 670 (0.0236 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK): 300 (80.6° F)

Minimum (^oK): 277 (39.2° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	3
Digital Points (No.):	
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	3
Failure Parameters	
Failure Rate or Mean (x $10^{\pm 9}$ hr):	NA
Standard Deviation (x 10^{+9} hr):	
Dormancy Factor (N.D.):	
Total Redundant Elements (No.):	6

Cost

Design Engineering ($1000):	719.0
Test and Evaluation ($1000):	209.0
Unit Production ($1000):	72.0
Reference Quantity (No.):	2
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	6.9
Development Lead Time Variable (months):	4.0
Qualification Lead Time Constant (months):	2.1
Qualification Lead Time Variable (months):	0.4
State-of-Art Factor (N.D.):	1.0

Subsystem: EP (0301)

Configurations: All

Equipment Type: Battery Charger

Performance

Technical Characteristics

(1) Current rating: 10.0 amps

(2) Efficiency (N.D.): 1.0

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts): NA

Maximum Power (watts): NA

Minimum Power (watts): NA

Nominal Voltage (volts): NA

Maximum Voltage (volts): NA

Minimum Voltage (volts): NA

Converter/Inverter Requirement (flag):

Weight (kg): 1.70 (3.75 lb)

Volume (cc): 3.1×10^3 ($0.11\ ft^3$)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK): 311 (100^o F)

Minimum (^oK): 266 (20^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	3
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	3
Digital Points (No.):	1
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	260
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	0	CER
Test and Evaluation ($1000):	0	
Unit Production ($1000):	0	
Reference Quantity (No.):	1	
Factor (N.D.):	1	

Schedule

Development Lead Time Constant (months):	8.1
Development Lead Time Variable (months):	3.5
Qualification Lead Time Constant (months):	2.3
Qualification Lead Time Variable (months):	0.3
State-of-Art Factor (N.D.):	1.0

Subsystem: EP (0302)

Configurations: All

Equipment Type: Battery Charger

Performance

Technical Characteristics

(1)	Current rating:	6.5 amps
(2)	Efficiency (N.D.):	1.0
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 1.66 (3.67 lb)

Volume (cc): 2.2×10^3 (0.076 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100^o F)
Minimum (^oK):	266 (20^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	3
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	3
Digital Points (No.):	1
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	260
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	0	CER
Test and Evaluation ($1000):	0	
Unit Production ($1000):	0	
Reference Quantity (No.):	1	
Factor (N.D.):	1	

Schedule

Development Lead Time Constant (months):	8.1
Development Lead Time Variable (months):	3.5
Qualification Lead Time Constant (months):	2.3
Qualification Lead Time Variable (months):	0.3
State-of-Art Factor (N.D.):	1.0

Subsystem: EP (0401)

Configurations: Shunt and Discharge Regulation

Equipment Type: Discharge Regulator

Performance

Technical Characteristics

(1)	Power capability:	59.0 watts
(2)	Efficiency (N. D.):	0.85
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 1.4 (3.0 lb)

Volume (cc): 8.5×10^3 ($0.3\ ft^3$)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100^o F)
Minimum (^oK):	266 (-20^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	3
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	3
Digital Points (No.):	1
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	250
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy-Factor (N.D.):	0.5
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	70.0
Test and Evaluation ($1000):	70.0
Unit Production ($1000):	25.0
Reference Quantity (No.):	1
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	8.1
Development Lead Time Variable (months):	2.0
Qualification Lead Time Constant (months):	2.3
Qualification Lead Time Variable (months):	0.1
State-of-Art Factor (N.D.):	1.0

Subsystem: EP (0501)

Configurations: Shunt & Shunt and Discharge Regulation

Equipment Type: Shunt Regulator

Performance

Technical Characteristics

(1) Maximum power capacity: 62.0 watts

(2)

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts): NA

Maximum Power (watts): NA

Minimum Power (watts): NA

Nominal Voltage (volts): NA

Maximum Voltage (volts): NA

Minimum Voltage (volts): NA

Converter/Inverter Requirement (flag):

Weight (kg): 2.0 (4.3 lb)

Volume (cc): 1.2×10^4 (0.43 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK): 373 (212^o F)

Minimum (^oK): 218 (-67^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	2
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	3
Digital Points (No.):	1
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	200
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	80.0
Test and Evaluation ($1000):	40.0
Unit Production ($1000):	7.0
Reference Quantity (No.):	4
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	9.5
Development Lead Time Variable (months):	3.6
Qualification Lead Time Constant (months):	2.3
Qualification Lead Time Variable (months):	0.2
State-of-Art Factor (N.D.):	1.0

Subsystem: EP (0601)

Configurations: All

Equipment Type: Battery Charger

Performance

Technical Characteristics

(1)	Current rating:	10.0 amps
(2)	Efficiency (N.D.):	0.85
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 3.2 (7.0 lb)

Volume (cc): 4.2×10^4 (1.5 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100° F)
Minimum (^oK):	266 (20° F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	6
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	3
Digital Points (No.):	1
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	650
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	0	CER
Test and Evaluation ($1000):	0	CER
Unit Production ($1000):	0	CER
Reference Quantity (No.):	1	CER
Factor (N.D.):	1	CER

Schedule

Development Lead Time Constant (months):	8.1
Development Lead Time Variable (months):	3.5
Qualification Lead Time Constant (months):	2.3
Qualification Lead Time Variable (months):	0.3
State-of-Art Factor (N.D.):	1.0

Subsystem: EP (0701)

Configurations: Shunt and Discharge Regulation

Equipment Type: Central Control Unit

Performance

Technical Characteristics

(1)

(2)

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 0.45 (1.0 lb)

Volume (cc): 2.8×10^3 (0.1 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100^o F)
Minimum (^oK):	266 (20^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	10
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	2
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	950
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	32.5
Test and Evaluation ($1000):	32.5
Unit Production ($1000):	11.5
Reference Quantity (No.):	1
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	8.1
Development Lead Time Variable (months):	1.2
Qualification Lead Time Constant (months):	2.3
Qualification Lead Time Variable (months):	0.1
State-of-Art Factor (N.D.):	1.0

Subsystem: EP (0801)

Configurations: Series Load Regulation

Equipment Type: Series Load Regulator

Performance

Technical Characteristics

(1)	Output power:	350.0 watts
(2)	Efficiency (N.D.):	0.9
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 0.73 (1.6 lb)

Volume (cc): 7.4×10^3 (0.26 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100^o F)
Minimum (^oK):	266 (20^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	6
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	3
Digital Points (No.):	1
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	650
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	45.0
Test and Evaluation ($1000):	45.0
Unit Production ($1000):	16.0
Reference Quantity (No.):	1
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	8.1
Development Lead Time Variable (months):	1.5
Qualification Lead Time Constant (months):	2.3
Qualification Lead Time Variable (months):	0.1
State-of-Art Factor (N.D.):	1.0

Subsystem: EP (0802)

Configurations: Series Load Regulation

Equipment Type: Series Load Regulator

Performance

Technical Characteristics

(1)	Output power:	225.0 watt
(2)	Efficiency (N.D.):	0.9
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 3.6 (8.0 lb)

Volume (cc): 8.5×10^3 ($0.30\ ft^3$)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100^o F)
Minimum (^oK):	266 (20^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	6
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	3
Digital Points (No.):	1
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	650
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	145.0
Test and Evaluation ($1000):	145.0
Unit Production ($1000):	51.5
Reference Quantity (No.):	1
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	8.1
Development Lead Time Variable (months):	3.3
Qualification Lead Time Constant (months):	2.3
Qualification Lead Time Variable (months):	0.2
State-of-Art Factor (N.D.):	1.0

Subsystem: EP (0901)

Configurations: All

Equipment Type: Battery Charger

Performance

Technical Characteristics

(1)	Current rating:	22.0 amps
(2)	Efficiency (N.D.):	0.85
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 3.6 (8.0 lb)

Volume (cc): 8.5×10^3 ($0.30\ ft^3$)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 ($100^o F$)
Minimum (^oK):	266 ($20^o F$)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	6
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	3
Digital Points (No.):	1
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	650
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	0
Test and Evaluation ($1000):	0
Unit Production ($1000):	0
Reference Quantity (No.):	1
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	8.1
Development Lead Time Variable (months):	3.5
Qualification Lead Time Constant (months):	2.3
Qualification Lead Time Variable (months):	0.3
State-of-Art Factor (N.D.):	1.0

Subsystem: EP (0902)

Configurations: All

Equipment Type: Battery Charger

Performance

Technical Characteristics

(1)	Current rating:	12.0 amps
(2)	Efficiency (N.D.):	0.85
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 0.64 (1.4 lb)

Volume (cc): 8.55×10^3 (0.302 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100^o F)
Minimum (^oK):	266 (20^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):		
Time Tagged Commands (No.):		
Other Commands (No.):	6	
High Rate Telemetry		
Analog Points (No.):		
Digital Points (No.):		
Sample Rate (sec^{-1}):		
Word Length (bits):		
Low Rate Telemetry		
Analog Points (No.):	3	
Digital Points (No.):	1	
Sample Rate (sec^{-1}):	1	
Word Length (bits):	8	
Safety		
Failure Model (flag):	1	
Failure Parameters		
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	650	
Standard Deviation ($\times 10^{+9}$ hr):		
Dormancy Factor (N.D.):	0.5	
Total Redundant Elements (No.):	4	
Cost		
Design Engineering ($1000):	0	
Test and Evaluation ($1000):	0	
Unit Production ($1000):	0	CER
Reference Quantity (No.):	1	
Factor (N.D.):	1	
Schedule		
Development Lead Time Constant (months):	8.1	
Development Lead Time Variable (months):	3.5	
Qualification Lead Time Constant (months):	2.3	
Qualification Lead Time Variable (months):	0.3	
State-of-Art Factor (N.D.):	1.0	

C.5

Subsystem: EP (1001)

Configurations: Series Load Regulation

Equipment Type: Solar Power Distributor

Performance

Technical Characteristics

(1)

(2)

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 0.45 (1.0 lb)

Volume (cc): 2.8×10^3 ($0.1\ ft^3$)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100^o F)
Minimum (^oK):	266 (20^o F)

Pressure (kg/m^2):

Performance (continued)	
CDPI	
Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	3
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	3
Digital Points (No.):	1
Sample Rate (sec^{-1}):	1
Word Length (bits):	8
Safety	
Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	300
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4
Cost	
Design Engineering ($1000):	32.5
Test and Evaluation ($1000):	32.5
Unit Production ($1000):	11.5
Reference Quantity (No.):	1
Factor (N.D.):	1
Schedule	
Development Lead Time Constant (months):	8.1
Development Lead Time Variable (months):	1.2
Qualification Lead Time Constant (months):	2.3
Qualification Lead Time Variable (months):	0.1
State-of-Art Factor (N.D.):	1.0

Subsystem: EP (1101)

Configurations: Series Load Regulation

Equipment Type: Power Distributor

Performance

Technical Characteristics

(1)

(2)

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 0.45 (1.0 lb)

Volume (cc): 2.8×10^3 ($0.1\ ft^3$)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100^o F)
Minimum (^oK):	266 (20^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	3
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	3
Digital Points (No.):	1
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	300
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	32.5
Test and Evaluation ($1000):	32.5
Unit Production ($1000):	11.5
Reference Quantity (No.):	1
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	8.1
Development Lead Time Variable (months):	1.2
Qualification Lead Time Constant (months):	2.3
Qualification Lead Time Variable (months):	0.1
State-of-Art Factor (N.D.):	1.0

Subsystem: EP (1201)

Configurations: Shunt Regulation

Equipment Type: Power Control Unit

Performance

Technical Characteristics

(1)

(2)

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

Power

Average Power (watts):	NA
Maximum Power (watts):	NA
Minimum Power (watts):	NA
Nominal Voltage (volts):	NA
Maximum Voltage (volts):	NA
Minimum Voltage (volts):	NA
Converter/Inverter Requirement (flag):	

Weight (kg): 4.76 (10.5 lb)

Volume (cc): 6.2×10^3 (0.22 ft^3)

Vibration

Random (g, rms):

Non-Random (g):

Temperature

Maximum (^oK):	311 (100^o F)
Minimum (^oK):	266 (20^o F)

Pressure (kg/m^2):

Performance (continued)

CDPI

Power Switching Commands (No.):	
Time Tagged Commands (No.):	
Other Commands (No.):	4
High Rate Telemetry	
Analog Points (No.):	
Digital Points (No.):	
Sample Rate (sec^{-1}):	
Word Length (bits):	
Low Rate Telemetry	
Analog Points (No.):	2
Digital Points (No.):	2
Sample Rate (sec^{-1}):	1
Word Length (bits):	8

Safety

Failure Model (flag):	1
Failure Parameters	
Failure Rate or Mean ($\times 10^{\pm 9}$ hr):	421
Standard Deviation ($\times 10^{+9}$ hr):	
Dormancy Factor (N.D.):	0.5
Total Redundant Elements (No.):	4

Cost

Design Engineering ($1000):	175.0
Test and Evaluation ($1000):	175.0
Unit Production ($1000):	57.0
Reference Quantity (No.):	1
Factor (N.D.):	1

Schedule

Development Lead Time Constant (months):	8.1
Development Lead Time Variable (months):	3.8
Qualification Lead Time Constant (months):	2.3
Qualification Lead Time Variable (months):	0.3
State-of-Art Factor (N.D.):	1.0

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